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More than Just Words on a Screen: A Biopsychosocial Approach to Understanding Effects of Race-Related Media

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Abstract

Racial disparities in physical and mental health are ongoing and well-documented problems in the United States. Black Americans, compared to White Americans, have higher risk of obesity, heart disease, cancer, depression, and substance abuse. Research suggests prejudice and discrimination play a role in racial health disparities. Everyday discrimination is considered a chronic, psychosocial stressor that impacts the health of Black Americans. A biopsychosocial approach states there are various factors that contribute to the pathway from discrimination to disease and proposes complex relationships that explain effects of racial discrimination on health. The current study examined social factors (race-related media), biological factors (cortisol and dehydroepiandrosterone [DHEA]), and psychological factors (individual differences) in order to understand the interplay of multiple pathways from discrimination to disease. Participants ($N = 48$) completed an online questionnaire that assessed individual difference variables and experiences with race-related media. Then participants completed an in-lab study that measured baseline levels of cortisol and DHEA, and finally, participants completed a three day at-home longitudinal portion to assess the diurnal rhythms of cortisol and DHEA and daily exposure to positive and negative race-related media. Contrary to hypotheses, results indicated that baseline levels of cortisol and DHEA were significantly correlated among participants with frequent exposure to negative race-related media, but not among participants with frequent exposure to positive race-related media. Further, cortisol and DHEA diurnal slopes were significantly correlated and the cortisol and DHEA awakening responses were significantly correlated among both participants reporting frequent exposure to negative race-related media and

among participants reporting frequent exposure to positive race-related media. Results also indicated trait levels of optimism, perceived control, and racial identity may be protective factors against daily race-related stress from media. However, results indicated there were no differences in biological outcomes (cortisol and DEHA diurnal rhythms) between the two groups, but that participants reporting frequent daily exposure to negative race-related media had less daily positive affect than those reporting frequent daily exposure to positive race-related media. Results suggest negative race-related media may be a source of stress for Black Americans, thus contributing to racial health disparities.

More than Just Words on a Screen:
A Biopsychosocial Approach to Understanding Effects of Race-Related Media

Racial disparities in physical and mental health are ongoing and well-documented problems in the United States (Ward et al., 2019). Black Americans, compared to White Americans, have higher risk of obesity, heart disease, cancer, depression, and substance abuse (Williams & Mohammed, 2009). Further, Black Americans have higher cardiovascular disease mortality rates than White Americans (Cookerham, Baduldry, Hamby, Shikany, & Bae, 2017). The Centers for Disease Control and Prevention (2017) estimate that hypertension is prevalent among 40.3% of Black Americans, compared to 27.8% of White Americans. Additionally, compared to other racial groups, obesity, diabetes, heart disease, and asthma are more common among Black Americans (U.S. Department of Health and Human Services, 2017). These racial health disparities persist even after controlling for socioeconomic status and access to health care, suggesting there is a complicated relationship between race and health that is not explained by socioeconomic conditions (Crimmins, Hayward, & Seeman, 2004; Lockwood, Marsland, Matthews, & Gianaros, 2018).

Research suggests racial prejudice and discrimination play a role in racial health disparities (Berger & Sarnyai, 2015). Everyday racial prejudice and discrimination refers to a range of daily experiences that may be considered normal and reflect a systematic cultural bias in attitudes and behaviors toward racial minorities (Banks, Kohn-Wood, & Spencer, 2006). Perceived discrimination refers to the subjective perception and interpretation that one is a target of discrimination, whereas actual discrimination is the objective encounters of discrimination where an observer would state discrimination has

occurred (Schmitt, Branscombe, Postmes, & Garcia, 2014). Although actual and perceived discrimination are conceptually different, research suggests they have the same influence on health disparities (Pascoe & Smart Richman, 2009; Williams & Mohammed, 2009).

Racism is a considered chronic, psychosocial stressor that impacts the physical and mental health of Black Americans (Williams & Mohammed, 2009). In the present research, the term racism is used to describe both prejudiced attitudes and discriminatory behaviors targeted at an individual based on their racial group membership. The nature and expression of racism have shifted over the past 50 years, with blatant forms of racism decreasing and covert forms increasing (Mouzon, Taylor, Woodward, & Chatters, 2017). Covert and subtle forms of racism are frequent in the lives of Black Americans, for example, 42.9% of Black Americans reported regularly experiencing racism (Mouzon et al., 2017). Racial microaggressions is a term that is used to describe these covert and subtle forms of everyday racism (Sue et al., 2007). Racial microaggressions are experienced in everyday interactions (e.g., subtle insults and nonverbal behavior) that are often ambiguous in nature but have cumulative effects on racial minorities (Wong et al., 2014). Meta-analyses suggest microaggressions remain prevalent and contribute to racial health disparities (Paradies et al., 2015; Pascoe & Smart Richman, 2009).

The pathway from racism to disease is complex and not well understood. There is evidence that chronic, everyday experiences with racism causes racial health disparities (Pascoe & Smart Richman, 2009; Williams, Lawrence, Davis, & Vu, 2019; Williams & Mohammed, 2009). The chronic experiences with racism, such as a woman clutching her

purse as a Black male walks by, accumulates over time and may lead to health disparities through biopsychosocial mechanisms (Harrell et al., 2011).

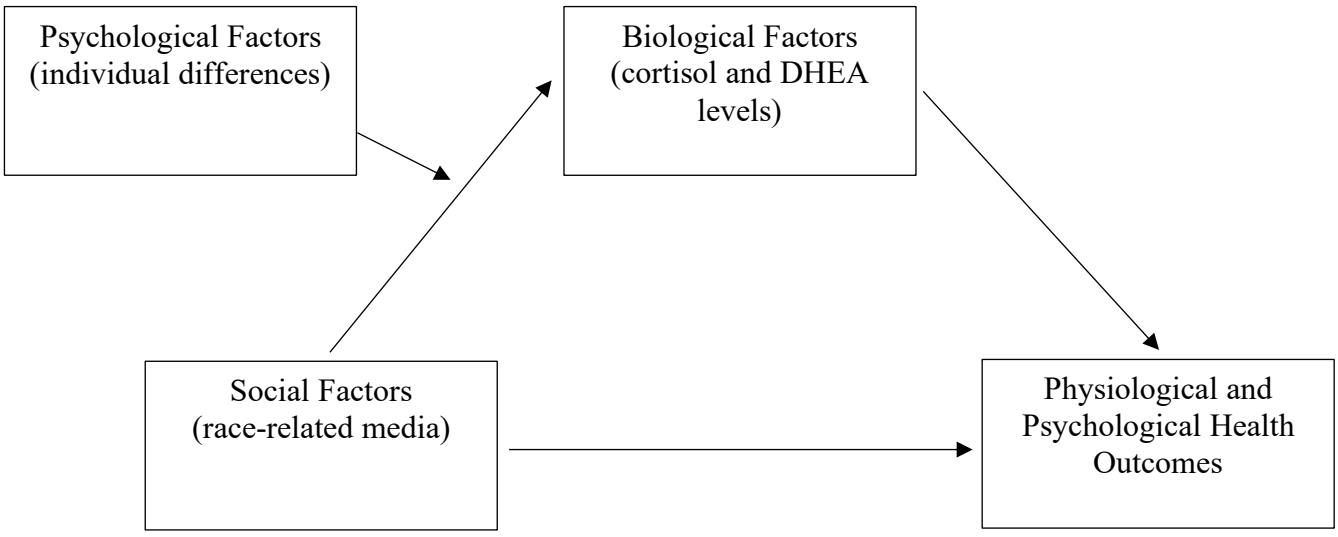
A biopsychosocial approach to understanding the impact of racism suggests there are various factors that contribute to the pathway from racism to disease and proposes complex relationships among family health history, socioeconomic status, and psychological and behavioral factors that influence the effects of racism on health (Clark et al., 1999; Lee et al., 2018; Lockwood et al., 2018). First, biological factors contribute to racial health disparities. Structural and functional changes in biological systems including the autonomic nervous system, the endocrine system, and the immune system all contribute to the onset and severity of stress-related diseases (Williams & Mohammed, 2009). Psychological factors identified in a biopsychosocial model include anxiety (Banks et al., 2006; Lee et al., 2018), depression (Brody et al., 2006), anger and sadness (Broudy et al., 2007), and low self-esteem (Greene et al., 2006). Psychological factors may contribute to the vulnerability and resilience of Black Americans to racial stress (Clark et al., 1999; Lee et al., 2018).

Finally, social factors contribute to racial stress and lead to racial health disparities. For example, racism is noted to be more severe for Black Americans with lower socioeconomic status (Jackson, Kubzansky, & Wright, 2006) and for those with darker skin tones (Carter, 2007). Other social factors include fear and anxiety of being discriminated against (Assari et al., 2015; Jones et al., 2014) and viewing race-related media. Specifically, race-related media is media that is related to social issues regarding people of color or generally containing themes on race-related topics (Oliver, Ramasubramanian, & Kim, 2009). Overall, a biopsychosocial model of racism suggests

an interplay of biological, psychological, and social factors that explain the pathways from racism to disease.

This study examines biological, psychological, and social factors that contribute to racial health disparities. Specifically, this study investigates how racism in daily race-based media (social factors) relates to stress mechanisms (biological factors) and what individual differences (psychological factors) protect Black Americans from potential negative psychological and physiological health outcomes (see Figure 1). This study investigates young adults' (aged 18-30) exposure to negative and positive race-related media, including online and offline traditional media (TV, newspapers, magazines) and online social media (Facebook, Twitter, Instagram, etc.), and how this relates to stress activation as a mechanism that may impact health.

Figure 1. A Biopsychosocial Model of how Race-Related Media Exposure Predicts Health Outcomes



Social Factor: Media

In 2016, it was estimated that 82% of all young adults visit at least one social media site everyday (Twenge, Matrin, & Spitzberg, 2019), which is a dramatic increase from 12% in 2005 (Perrin, 2015). Further, 88% of young adults have a computer in their home and 95% own a smartphone (Anderson & Jiang, 2018). Given its prevalence, social media likely plays an important role in young adults' lives including identity development and expression (Christofides et al., 2009), formation and quality of interpersonal relationships (Valkenburg et al., 2006; Williams & Merten, 2011), and general psychological well-being (Caplan, 2007; Skoric et al., 2009).

Given the infancy of research on social media (< 20 years), the scientific community has much to learn about how social media impacts the daily lives, health, and psychological well-being of young adults. The current literature reports mixed effects of social media. Some beneficial effects include building a sense of community, enhancing social relationships and social capital (Ellison et al., 2007; Williams, 2006), shaping personal identity (Christofides et al., 2009), strengthening family connections (Williams & Merten, 2011), increasing access to health care and advice (Hackworth & Kunz, 2010), increased self-esteem after receiving positive feedback (Valkenburg et al., 2006), lower stress and positive well-being (Park, Song, & Lee, 2014), and positive life satisfaction, social trust, civic engagement, and political participation (Valenzuela, Park, & Kee, 2009).

Negative effects of social media include disruptions in everyday activities such as losing sleep, being late to class, missing schoolwork (Espinoza & Juvonen, 2011), lower self-esteem after receiving negative feedback (Valkenburg et al., 2006), increased risk of

depression (Lin et al., 2016) and loneliness (Sheldon et al., 2011), greater risk taking behaviors (Cookingham & Ryan 2015), and increased social anxiety (Landoll et al., 2015), particularly among those addicted to the internet (Lewis & West, 2009). There are still unanswered questions about the impact of social media on young adults, but a meta-analysis indicated 80% of studies find positive outcomes compared to negative ones (Boulianne, 2015).

Race-related media (traditional and social) can also have both positive and negative impacts in the lives of young Black Americans as well. For the purposes of the current study, race-related media is defined as any form of media (traditional or social) that is related to social issues regarding people of color or a generally contains themes on race-related topics (Oliver, Ramasubramanian, & Kim, 2009). This type of media does not include fictional television shows; rather it includes news media covering current race-related issues. For example, news coverage of the Black Lives Matter movement (Leopold & Bell, 2017), the confederate war monuments debate (Kellner, 2018), a police shooting involving a White officer and Black victim (Johnson, 2018), or a story involving a Black American athlete (Deeb & Love, 2017) are all considered race-related media topics.

A negative role of race-related media includes expression of racial microaggressions. Racial minorities are more likely to be depicted as criminals, aggressive, and unintelligent, which reinforces and perpetuates racial prejudice and benevolent racism (Johnson, Adams, Hall, & Ashburn, 1997; Ramasubramanian, 2007). Further, an analysis of media crime coverage shows that the phrase “threatening black male” is used frequently (Entman, 1992) and coverage of crimes committed by Black

Americans are exaggerated whereas coverage of the victimization of Black Americans is downplayed (Ghandnoosh, 2014).

Perpetuating negative race stereotypes and racism is prevalent in race-related media (Kite & Whitley, 2016; Lee-Won, Lee, Song, & Borghetti, 2017; Rauch & Schanz, 2013). Media can be used as a platform to communicate negative perceptions of Black Americans and to foster and develop racist attitudes (Olushola, 2015) and plays a critical role in the perceptions of racial movements (Carney, 2016). Young adults are using media as a method to voice racism and to socially influence their peers (Kite & Whitley, 2016; Rauch & Schanz, 2013). Research on Facebook showed that people who use the social media site for social connection are more persuaded by negative racial messages than people who use social media to obtain information (Rauch & Schanz, 2013). The increased rate of hateful content online correlates with higher rates of hate crime and racist behavior (Chan & Seamans, 2016), possibly due to media creating polarization and fostering more bias among people with preexisting biases (Alsaad & Al-Jediah, 2018). Recently, media has been shown as a source to reinforce stereotypes and marginalize Black Americans (Kathy & Irena, 2018). Exposure to race-related media can negatively affect racial minorities if the media contains racist messages (Hodges, 2015; Smiley & Fakunle, 2016).

Despite the negative effects of media, it can be a source of activism for marginalized groups (Bonilla & Rosa, 2015). Although, media can be a source of racism, research on digital ethnography shows media can also be used as a platform to promote social change and to strengthen ingroup identity and intergroup relations (Bilali, Vollhardt, & Rarick, 2017; Christofides et al., 2009). A “Black Twitter” community has

emerged to provide a community in which Black Americans can express their views on social issues (Florini, 2014). This platform may be beneficial for combatting everyday racism and promoting social justice through social organizing such as the #BlackLivesMatter movement. Research indicates social media is used to respond to specific grievances, such as the 2014 shooting of Michael Brown in Ferguson, Missouri, and mobilize a mass movement to promote solidarity (Ince et al., 2017). Research on the #BlackLivesMatter movement on Twitter indicates tweets using the hashtag were more likely to discuss solidarity than blame the police for violence (Ince et al., 2017). The #BlackLivesMatter hashtag was one of the most widely used tags on Twitter and Facebook in 2014 and was identified by *Yes! Magazine* as one of the twelve hashtags that changed the world in 2014. In sum, research shows that racism is pervasive in media (traditional and social) and has both positive and negative effects on young adults. To address the complexity of this issue, this study examines the effects of exposure to positive or negative race-related media (traditional and social) on young Black Americans' physiological and psychological health outcomes.

Biological Factors: Cortisol and Dehydroepiandrosterone

Cortisol, a hormone produced by the adrenal glands, is a product of the hypothalamic-pituitary-adrenal (HPA) axis and is released in times of stress. When a person experiences any physical or emotional stress, the HPA axis becomes active, and cortisol is released. The HPA axis is the central stress response system and has many connections to the nervous system, endocrine system, and immune system (McEwen, 2005). For racial minorities, experiencing everyday racism is stressful (Pascoe & Smart Richman, 2009; Williams & Mohammed, 2009). In support of the biological aspect of a

biopsychosocial model of racial health disparities, a growing body of literature notes that prolonged, higher levels of cortisol are prevalent in Black Americans with higher cumulate experiences of discrimination (Berger & Sarnyai, 2015; Boileau, Barbeau, Sharma, & Bielajew, 2019). Further, there are differences in baseline cortisol levels and cortisol reactivity in Black Americans with higher cumulate levels of experiences of racism (Huynh, Guan, Almeida, McCreath, & Fuligni, 2016).

The HPA axis is a regulatory system that is associated with secretions of hormones in order to maintain homeostasis (McEwen, 1998). In times of stress, HPA activation is essential for ability to cope, adapt, and recover from the stressor; however, chronic HPA activation due to chronic stress is maladaptive and creates allostatic load. Allostatic load is characterized by an excessive and prolonged amount of stress that impacts the body's homeostatic balance (McEwen, 1998). Allostatic load leads to maladaptive dysregulation of the HPA axis and is suggested to be the basis for stress-related health disparities (Shea, Walsh, MacMillian, & Steiner, 2005). Individuals with higher allostatic load and dysregulation of the HPA axis have blunted cortisol morning waking responses and decreased slopes throughout the day (Adam et al., 2015). Previous research shows Black American adolescents have an increased risk of allostatic load compared to White American adolescents (Skinner et al., 2013).

Dysregulation of the HPA axis is characterized by the breakdown of the cortisol negative feedback loop (Mizoguchi et al., 2008). This results in inappropriate physiological responses to stressors (Kinlein, Wilson, & Naratsoreos, 2015), meaning that the body is not producing the right hormones to maintain homeostasis. Dysregulation of the HPA axis exhibits changes in diurnal HPA activity and can be characterized by a

flatter cortisol slope decline throughout the day (Zeider, Doane, & Roosa, 2012) and a lower cortisol awakening response (CAR). In healthy participants, CAR increases 30 minutes after waking and cortisol levels, or slope, slowly decline throughout the day (Huyhn et al., 2016). Chronic stress is linked to flatter slope decline and decreases in CAR (Cohen et al., 2006). Both slope and CAR are indicators of HPA regulation and are common biomarkers used to access the dysregulation the HPA system in response to everyday experiences with racism (Adam et al., 2015; Williams, Lawrence, Davis, & Vu, 2019).

Multiple studies have found higher everyday perceived discrimination predicts flatter diurnal cortisol slopes and lower morning waking cortisol response peaks (CAR), indicating a maladaptive cortisol response and dysregulation of the HPA axis (Adam et al., 2015; DeSantis et al., 2007; Zeiders, Hoyt, & Adam, 2014). For example, Skinner et al. (2011) reported that Black young adults who have higher daily perceived discrimination have flatter diurnal cortisol slopes compared to White young adults. Finally, a recent study found that among Black adolescents', everyday discrimination was associated with flatter cortisol slopes, lower CAR, and lower bedtime cortisol levels (Huyhn et al., 2016). The dysregulation is due to chronic levels of higher cortisol from experiencing racial stress everyday (Allen et al., 2019; Berger & Sarnyai, 2015). The interaction between racial discrimination and neuroendocrine responses (i.e., cortisol) are well-documented among Black Americans and are considered one of the causes of racial health disparities (Lee et al., 2018).

In addition to cortisol, prior research shows the impact of stress on the anabolic hormone dehydroepiandrosterone (DHEA). DHEA is the most abundant steroid hormone

and, like cortisol, is produced by the adrenal glands. DHEA has many functions including serving as a precursor to other hormones (e.g., androgens; Cutolo et al., 2004), promoting strength in organs (Omura, 2005), boosting the immune system (Cutolo et al., 2004), and promoting cellular resilience and repairing the body after cellular trauma (Omura, 2005). DHEA has both anti-glucocorticoid (Kalimi et al., 1994) and anti-inflammatory (Shields & Slavich, 2017) effects suggesting DHEA plays a role in immune functioning in times of acute stress (Prall, Larson, & Muehlenbein, 2017). Typically, DHEA has a positive relationship with cortisol such that when cortisol increases, DHEA increases as well (McCraty et al., 1998; Morgan et al., 2004). Specifically, the relationship between DHEA and cortisol is adaptive where DHEA counters the detrimental impact cortisol has on tissue and bone structure (Labrie et al., 2005). Because of the relationship DHEA has with cortisol and the immune system, DHEA is considered a mechanism that provides resiliency to the negative impacts of stress (Charney, 2004).

DHEA not only impacts cellular and biological structures, but also affects changes in affect and other psychological factors. Higher DHEA levels are associated with more positive affect (Rasmusson et al. 2004) whereas lower levels are associated with higher perceived stress, depression, and anxiety (Hellhammer et al., 2004; Wemm et al., 2010). Further, lower baseline levels of DHEA are also associated with weight gain, lower sex drive, affect dysregulation, lower self-esteem, and higher chances of developing cardiovascular disease (Wolkowitz et al., 1999). Higher DHEA levels are also associated with less risk-taking behavior (Ohana et al., 2015) and better decision-making ability (Shields, Lam, Trainor, & Yonelinas, 2016) suggesting DHEA plays a role in several psychological outcomes.

In acute emotional stress situations, DHEA increases (Dickerson & Kemeny, 2004; Lennartsson et al., 2012b). However, few studies have investigated the impact of race-based emotional stress on DHEA (Busse, Yim, Campos, & Marshburn, 2017). In one study, participants who completed a Trier Social Stress task while being evaluated by a researcher of the same race had increased levels of DHEA whereas those evaluated by a different race researcher showed no changes in DHEA (Mendes et al., 2011). Additionally, prior research suggests that after racial stress, there is a decrease in circulating DHEA levels (Mendes et al., 2007) and racial minorities who reported greater ingroup pride had significantly higher baseline levels of DHEA than those reporting less ingroup pride (Ratner, Halim, & Amodio, 2013). Prior research supports that DHEA increases during stressful situations (Dickerson & Kemeny, 2004); however, race-based stress specifically, shows the opposite effect by producing decreased DHEA levels (Mendes et al., 2007).

In relation to diurnal DHEA rhythms (slope and the awakening response), few studies have investigated the diurnal patterns of DHEA. A study with healthy participants showed that DHEA parallels diurnal cortisol activity; however, DHEA seems to be stable throughout the day whereas cortisol is more sensitive to change (Hucklebridge, Hussain, Evan, & Clow, 2005). Yet, another study found teenagers with major depressive disorder tend to have cortisol/DHEA dysregulation as see by higher evening cortisol and lower morning DHEA (Goodyer, Herbert, Altham, & Pearson, 1996). Specifically, in relation to racial stress, a recent study found that racial discrimination predicted cortisol/DHEA diurnal ratios as mediated by depressive symptoms (Lee et al., 2018).

The dysregulation of cortisol and DHEA has been shown in relation to depressive symptomology (Watson & Mackin, 2006); however, more research is needed to understand the impact of racial discrimination on the regulation of diurnal cortisol and DHEA levels. The present study expands on these relationships by specifically looking at race-related stress and the impact of regulation of cortisol and DHEA baseline and diurnal levels. Given the scarcity of research on the relationship between DHEA and race-related stress, this study attempts to further our understanding of the role of DHEA and its relation with cortisol in response to race-related stress. Additionally, this study investigates how cortisol and DHEA synchronize (correlates) in the diurnal rhythm. The current study investigates biological factors in the biopsychosocial model by measuring how cortisol and DHEA are related in response to chronic and everyday experiences of racial stress (e.g., race-related media).

Psychological Factors: Individual Differences

Within the biopsychosocial model framework, it is important to consider individual differences that may weaken or exacerbate the relationship between social and biological factors. Individual differences may moderate the effects of racism on racial minorities (Lee et al., 2018). For example, self-esteem moderates the link between perceived discrimination and psychological distress (Moradi & Subich, 2004). A meta-analysis suggests lower self-esteem can increase vulnerability to the adverse effects of discrimination (Lee & Ahn, 2012). Further, self-esteem is a protective factor such that young racial minorities who have higher self-esteem report less stress from everyday discrimination (Cassidy, O'Connor, Howe, & Warden, 2004). Self-esteem is closely

related to another individual difference variable, ability to cope, which is discussed later (Umana-Taylor, Vargas-Chanes, Garcia, & Gonzales-Backen, 2008).

Another individual difference variable that moderates the relationship between social and biological factors is optimism. Dispositional optimism, the belief that good things will happen, tends to be relatively stable and is linked to better physiological health and well-being (Dcheier & Carver, 2018). Epidemiological studies suggest that optimistic people are less likely to report sickness and more likely to live past the age of 85, suggesting that optimism may be an important psychological factor for extending the lifespan (Lee et al., 2019). Black Americans higher in optimism tend to report higher subjective well-being (Vacek, Coyle, & Vera, 2011). Further, optimism moderates the relationship between race-related stress and anxiety, such that Black Americans higher in optimism report less anxiety symptomology after experiencing a race-related stressor compared to Black Americans with lower optimism (Lee, Neblett, & Jackson, 2015). In contrast, dispositional pessimistic outlook on life correlates with greater emotional vulnerability (Kaiser, Major, & McCoy, 2004). These effects suggest that optimism may moderate the effects of experiences with racism on racial health disparities.

In addition to optimism, perceived control is suggested to be a resiliency factor. Perceived control is a person's belief in their capacity to have control over their own life and over their environment (Misono, Meredith, Peterson, & Frazier, 2016). Higher levels of perceived control are linked to better self-reported general health (Gillebaart & Ridder, 2019). Perceived control in minority group members increases the likelihood of minimizing experiences of discrimination, which protects self-esteem and is psychologically beneficial (Ruggiero & Taylor, 1997). Additionally, Black young adults

higher in perceived control are more likely to seek social support and use problem solving coping strategies when faced with racial discrimination (Barnes & Lightsey, 2011; Scott & Hourse, 2005). Perceived control may be an individual difference that increases ability to cope with discrimination leading to better health outcomes when faced with racial stress.

An individual difference variable closely related to perceived control is the ability to cope with discrimination. Ability to cope may protect against the negative impact of discrimination on health (Scott, 2003; Yoo & Lee, 2005). Coping is an assessment of resources (e.g., physical, social, or psychological) and the belief that one has the resources to deal with the stressor (Lazarus & Folkman, 1984). Previous research shows that there are health consequences associated with coping ability in response to discrimination (Noh & Kaspar, 2003; Walsh et al., 2018). For example, Black Americans who report being able to cope with daily discrimination have better physiological and psychological health outcomes (Lee-Won, White, & Potocki, 2018; Wu & Buchanan, 2019). Further, perceived ability to cope with discrimination has the potential to decrease the negative impact of everyday discrimination on minorities (Barnes & Lightsey, 2005).

Race-related individual differences also impact the relation between racism and physiological and psychological health outcomes. For example, higher self-reported everyday experiences with discrimination correlates with symptoms of both depression and anxiety (Banks, Kohn-Wood, & Spender, 2006). Lifetime experiences of everyday discrimination is associated with more chronic diseases and lower overall self-reported health (Harris et al., 2006). Higher self-reported everyday experiences with perceived

discrimination heightens the stress response and contributes to the likelihood of stress related health issues (Pascoe & Smart Richman, 2009).

Another race-related individual difference variable is racial identity. Racial identity is one of the most well-researched individual differences that buffers the negative impact of discrimination on physiological and psychological outcomes. For example, Korean Americans with stronger racial identity experienced fewer negative outcomes from discrimination than those with weaker racial identification (Lee, Lee, Hu, & Kim, 2015). Although increased racial identity can protect from negative outcomes, a meta-analysis suggests that the role of racial identity is more complicated and depends on other factors including experiences of past discrimination (Smith & Silva, 2011). For instance, studies suggest that individuals with stronger racial identity are more likely to report racial discrimination (McCoy & Major, 2003; Sellers & Shelton, 2003) suggesting that stronger racial identity predicts greater self-reported past experiences with discrimination.

Rejection sensitivity is another race-related individual difference that may moderate the negative effect of experiences with racism. Prior research suggests that Black Americans with greater race-rejection sensitivity have higher levels of cortisol, and higher race-rejection sensitivity is a predictor of negative emotions among minority groups (Page-Gould, Mendoza-Denton, & Tropp, 2008). Rejection sensitivity is how much a person needs to be accepted by their peers, how much fear a person holds about their likelihood of not being accepted, and the salience of social exclusion based on prior experience (Berger & Sarnyai, 2014; Mendoza-Denton, Downey, Purdie, David, & Pietzak, 2002; Sawyer et al., 2012). A meta-analysis suggests there are associations between rejection sensitivity and depression, anxiety, and personality disorders (Gao,

Assink, Cirpriani, & Lin, 2017), therefore, race rejection-sensitivity may be a moderator of the relationship between racism and adverse outcomes.

Another race-related individual difference that may moderate the impact of racism on health disparities is activism orientation. Activism orientation is a proactive coping skill associated with adaptive approach motivation tendencies (Shelton, Richeson, Salvatore, & Hill, 2006). Activism orientation is an effective way to reduce prejudice by increasing perceived control (Czopp & Monteith, 2003). Research suggests that activism orientation may be a positive coping skill that protects Black Americans from the adverse health outcomes of racism.

Individual difference variables including resilience variables (e.g., self-esteem, optimism, perceived control, and ability to cope with discrimination) and race-related variables (e.g., experiences with discrimination, racial identity, race-rejection sensitivity, and activism orientation) may moderate the level of distress experienced due to frequent exposure to negative race-related media. The current study adds to the literature by identifying how individual difference variables moderate the relationship between exposure to race-related media and baseline and longitudinal stress responses via HPA activation (e.g., cortisol and DHEA).

Responses to Racism: Health Consequences

Responses to racism play a large role in both physical and mental health outcomes and disparities. Research suggests that racial health disparities may be caused by chronic stress due to a lifetime of perceived racism (Busse et al., 2017). As previously discussed, race-related stressors have an impact on physiological health disparities through the dysregulation of the HPA axis. Many studies suggest that the cardiovascular system is the

most impacted by the stress of racism (Busse et al., 2017) due to increased blood pressure. However, as stated, compared to other racial groups, obesity, diabetes, asthma, cancer, depression, and substance abuse are more common among Black Americans (U.S. Department of Health and Human Services, 2017; Williams & Mohammed, 2009). Specifically, racial stress activates the stress response and chronic activation of the stress response leads to chronically higher levels of cortisol which damages receptor sensitivity and causes tissue damage (McEwen, 1998, Zeider, Doane, & Roosa, 2012). Chronic racial stress causes a dysregulation of the HPA axis and HPA dysregulation is indicated by flatter diurnal cortisol slopes (Michaud et al., 2008) and decreased CAR (Pruessner et al., 2003). Flatter diurnal cortisol slope and decreases in CAR increase physiological health risks and are indicators of maladaptive adrenal fatigue. Adrenal fatigue may be linked to various stress related health problems including cardiovascular disease and chronic pain (Wolkowitz et al., 1999).

In addition to these physiological health consequences, psychological health is also impacted by experiences with racism. Perceived racism impacts psychological responses (Bennett, Merritt, Edwards, & Sollers, 2004; Brown et al., 2000) where greater experiences with racism is correlated with symptoms of depression (Lee et al., 2018) and increased psychological distress (Britt-Spells, Slebodnick, Sand, & Rollock, 2016). Black Americans who report more daily racism also report higher stress (Harrell et al., 2011). Studies have found that daily perceived discrimination increases feelings of general overall life stress (Pieterse, Carter, & ray, 2013) and greater everyday psychological distress (Broman, Mavaddat, & Hsu, 2000). Black Americans tend to have poorer levels

of overall psychological functioning as indicated by increased depression and anxiety symptomology (Bynum, Burton, Best, 2007).

Another psychological outcome of racism is lower self-esteem. As discussed, trait self-esteem can be a moderator of the relationship between racism and health outcomes, whereas, state self-esteem has been found to be an outcome of racism. Perceived racism can create feelings of reduced control and lower self-esteem (Jones, Cross, & Defour, 2007; Stock, Peterson, Molloy, & Lambert, 2017). Specifically, after experiencing racism, self-esteem decreases and lower self-esteem leads to more depressive symptomology (Mereish, N'cho, Green, Jernigan, & Helms, 2016).

The last major psychological effect of racism is increased negative affect. Affect is frequently described as mood and emotions (Clark, Salas-Write, Vaugh, & Whitefield, 2015) and impacts how people cope and assess daily situations. Many studies have found that racial discrimination and past experiences with racial discrimination heighten negative affect (Hurd, Varner, Cladwell, & Zimmerman, 2014; Pascoe & Smart Richman, 2009). Negative affect includes feelings of anger (Gibbions et al., 2010), unease (Zhang, Crant, & Weng, 2019), and depression and anxiety (Robert et al., 2012). Greater negative affect is suggested to exacerbate the negative health effects of experiencing racism (Stick, Peterson, Molloy, & Lamber, 2017). Negative emotions caused by experiences with racism may attenuate cortisol reactivity to future stressors (Assari et al., 2015), reflecting HPA dysregulation. Changes in cortisol reactivity may then contribute to the poorer psychological well-being (Bennett, Merritt, Edwards, & Sollers, 2004) and changes in neural emotional circuits, emotion regulation, cognition, and affect (Harrell et al., 2011).

This study investigates the role of racial stress on physiological and psychological health outcomes by measuring whether frequent exposure to positive or negative race-related media predicts differences in diurnal cortisol and DHEA levels, and self-report daily stress, state self-esteem, and positive affect.

Present Study

The current study examines multiple aspects of a biopsychosocial model approach to understanding racial health disparities by investigating the relationships among frequent exposure to positive or negative race-related media, biological markers (cortisol and DHEA), individual differences, and physiological and psychological health outcomes (e.g., daily levels of cortisol and DHEA, self-reported stress, state self-esteem, and affect). Experiences with racism are examined longitudinally to understand how daily frequent exposure to positive or negative race-related media correlates with diurnal rhythms of cortisol and DHEA and predicts psychological outcomes. Everyday experiences with racism in the media may partially account for HPA axis dysregulation (that is, higher baseline levels, flatter slopes, and blunted awakening responses) and negative psychological health outcomes, but more research is needed to fully understand these relationships. This study also assesses how individual difference variables (that is, trait self-esteem, optimism, perceived control, ability to cope with discrimination, past experiences with discrimination, racial identity, race-rejection sensitivity, and activism orientation) moderate the relationship between frequent of exposure to positive or negative race-related media and negative health outcomes (i.e., HPA axis dysregulation, self-reported stress, daily state self-esteem, and affect).

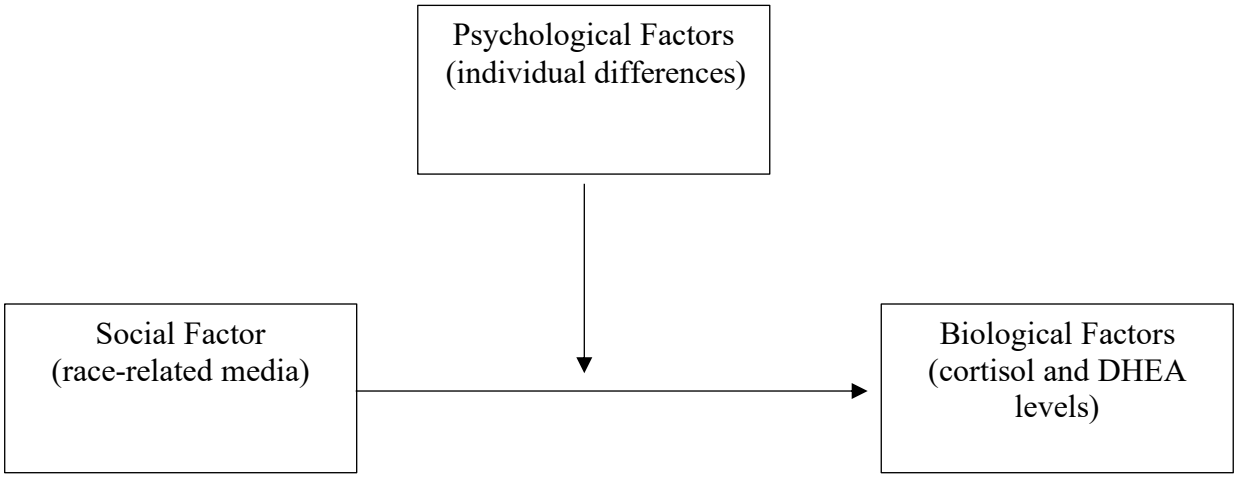
Hypothesis 1. Frequent exposure to negative race-related media content will predict a) dysregulation (no significant correlation) between baseline cortisol and DHEA levels; b) dysregulation (no significant correlation) between diurnal cortisol slope and diurnal DHEA slope; and c) dysregulation (no significant correlation) between the cortisol awakening response and the DHEA awakening response, whereas, women reporting frequent exposure to positive race-related media content will have significant correlations between cortisol and DHEA levels (that is, baseline levels, diurnal slope, and the awakening responses).

Hypothesis 2. Frequent exposure to negative race-related media content will predict higher levels of baseline a) cortisol and b) DHEA; predict flatter diurnal c) cortisol slope and d) DHEA slope; and predict a more blunted e) cortisol awakening response; and f) DHEA awakening response compared to participants reporting frequent exposure to positive race-related media content.

Hypothesis 3. The relationship between frequent exposure to negative race-related media (e.g., baseline and daily) and cortisol and DHEA levels (e.g., baseline, slopes, and awakening responses) will be moderated by individual differences such that a) lower trait self-esteem; b) lower optimism; c) lower perceived control; d) less ability to cope with discrimination; e) more past experiences with discrimination; f) weaker racial identity; g) higher race-rejection sensitivity, and h) lower activism will strengthen the relationship between more frequent negative exposure to race-related media and biomarker levels (see Figure 2). This pathway will be weakened for individuals with a) higher trait self-esteem; b) higher trait optimism; c) higher perceived control; d) higher ability to cope with discrimination; e) fewer past experience with discrimination; f) stronger racial identity; g)

lower race rejection sensitivity; and h) higher activism. The relationship between frequent exposure to positive race-related media (e.g., baseline and daily) and cortisol and DHEA levels will not be significantly moderated by individual differences as positive race-related media will not significantly predict cortisol and/or DHEA levels.

Figure 2. Hypothesis 3 Moderation Model

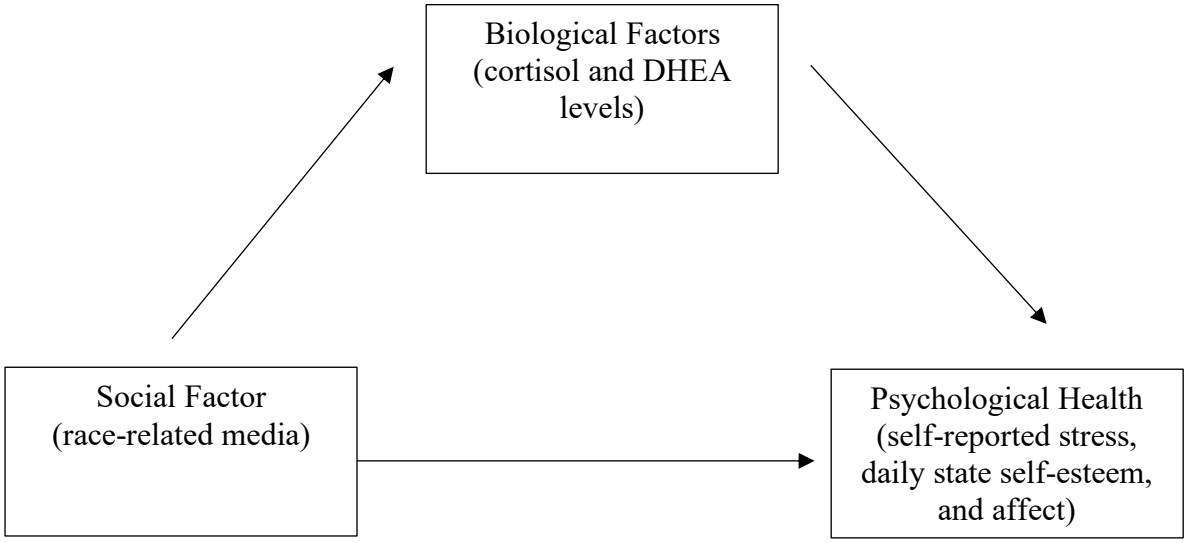


Hypothesis 4. Frequent daily exposure to negative race-related media will predict a) higher self-reported stress; b) lower state self-esteem; and c) less positive affect compared to participants reporting frequent daily exposure to positive race-related media.

Hypothesis 5. At baseline, cortisol and DHEA levels will mediate the relationships between baseline frequent negative exposure to race-related media and psychological outcomes such that negative, frequent exposure will predict higher cortisol levels and higher cortisol levels will predict a) higher self-reported stress and b) less positive affect. Similarly, frequent exposure to negative race-related media will predict higher DHEA levels, and higher DHEA levels will predict c) higher self-reported stress and d) less positive affect (see Figure 3). There will be no mediational relationship among frequent exposure to positive race-related media, cortisol and DHEA, and

psychological outcomes because frequent, positive exposure to race-related media is not predicted to be related to cortisol and/or DHEA levels.

Figure 3. Hypotheses 5 and 6 Mediation Model

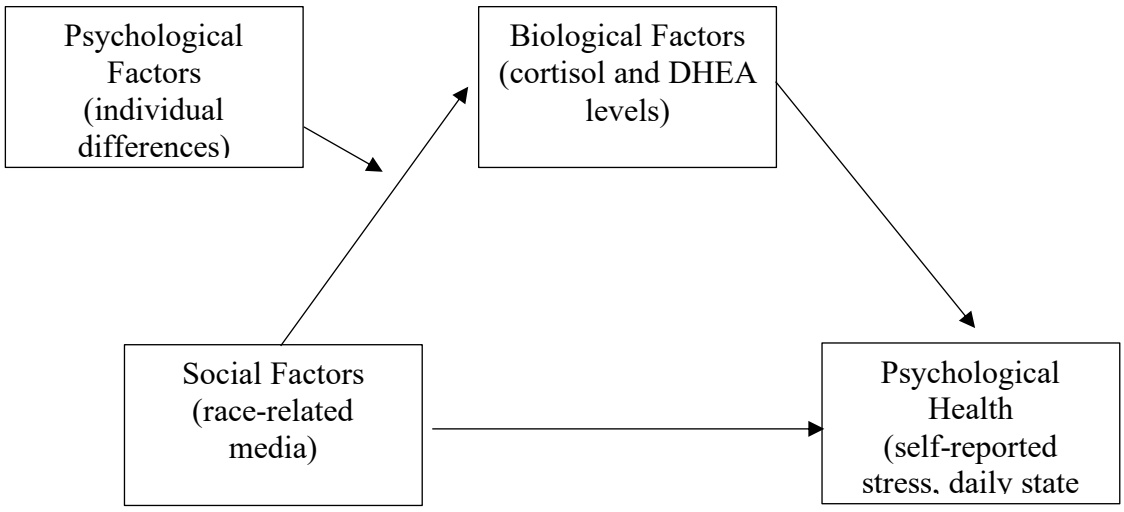


Hypothesis 6. Daily cortisol and DHEA levels will mediate the relationships between daily, frequent negative exposure to race-related media and psychological outcomes such that daily, frequent negative exposure will predict flatter diurnal cortisol slope and flatter cortisol slope will predict a) higher self-reported stress b) decreased state self-esteem and c) less positive affect; frequent exposure to negative race-related media will predict flatter diurnal DHEA slope and flatter DHEA slope will predict d) higher self-reported stress e) decreased state self-esteem and f) less positive affect. Similarly, frequent exposure to negative race-related media will predict a blunted cortisol awakening response and a blunted cortisol awakening response will predict g) higher self-reported stress h) decreased state self-esteem and i) less positive affect; and frequent exposure to negative race-related media will predict a blunted DHEA awakening response and a blunted DHEA awakening response will predict j) higher self-reported

stress k) decreased state self-esteem and l) less positive affect (see Figure 3). There will be no mediational relationship among frequent daily exposure to positive race-related media, cortisol and DHEA, and psychological outcomes because frequent, positive exposure to race-related media is not related to cortisol and/or DHEA levels. Only state self-esteem is an outcome for the daily analyses because only trait self-esteem and not state self-esteem is taken at baseline.

Hypothesis 7. The mediational relationships proposed in Hypotheses 5 and 6 will be moderated by the individual differences variables in the same pattern outlined in Hypothesis 2 with a) lower trait self-esteem (baseline); b) lower trait optimism; c) lower perceived control; d) less ability to cope with discrimination; e) more past experiences with discrimination; f) weaker racial identity; and g) lower activism will strengthen the mediational relationship among frequent exposure to negative race-related media, cortisol and DHEA levels, and stress, state self-esteem (daily), and affect (see Figure 4).The A path from predictor to mediator will be weakened for individuals with a) higher trait self-esteem (baseline); b) higher trait optimism; c) higher perceived control; d) higher ability to cope with discrimination; e) fewer past experiences with discrimination; f) stronger racial identity; g) lower race rejection sensitivity; and h) higher activism. No relationship is expected for frequent exposure to positive race-related media, as frequent exposure to positive race-related media does not predict differences in stress-related biomarkers.

Figure 4. Hypothesis 7 Moderated Mediation Model



Method

Participants

141 participants were recruited from the University of Missouri-St. Louis, the Department of Psychological Sciences Sona Systems (Bethesda, Maryland) research participant pool, and ResearchMatch (Nashville, Tennessee). All participants were college students from The University of Missouri- St. Louis or Washington University in St. Louis.

Participants included women ages 18 to 30 who self-identified as Black or African American. Participants who identified as multiracial were included if they identified as Black or African American. Only 18 to 30-year-old women were recruited for the study in order to reach the young adult population and to help control for natural decreases in DHEA with age. Additionally, research has identified emerging adulthood, roughly late teens to late 20s, as a critical period in development (Arnett, 2007; Lee et al., 2018; Rockett et al., 2006). During emerging adulthood, Black Americans are at greater

risk for experiencing racism as they move out of their familiar context and into new ethnically diverse environments (e.g., higher education, employment, and new social settings; Bernard et al., 2017; Hope et al., 2015; Hurd et al., 2014). In order to focus on the emerging adulthood period, only 18 to 30-year-olds were included in the study.

Women who were pregnant, lactating, or unsure whether they were pregnant were excluded from the study because of potential endocrinological differences among pregnant or lactating women. Women who smoked or used psychotropic drugs were excluded due to the potential impact on cortisol and DHEA.

In addition to gender, age, and race, there were psychological and physiological health criteria that were met. Women who were diagnosed with clinical depression or anxiety within the last 6 months or reported moderate to severe depression and/or anxiety symptomatology were excluded to avoid making daily race-related stressors more salient. Women previously diagnosed with post-traumatic stress disorder (PTSD), and those meeting PTSD symptom diagnostic criteria were also excluded (see Appendix C).

To get a suitable saliva sample, participants refrained from eating or drinking any fluids including water, brushing their teeth, or chewing gum or candy for 45 minutes before providing the sample. The purpose of these restrictions was to make sure that the saliva sample collected was pure and free of possible contaminants. In the case that participants met health criteria but violated one of the restrictions on drinking, eating, or teeth brushing, they were rescheduled when they could attend the lab session without eating, drinking, or brushing their teeth beforehand. Finally, for the study to be relevant and accessible, participants must currently be using any form of media (e.g., Facebook,

Twitter, Instagram, etc.) at least once per day. To complete study measures, participants must have had regular access to a smartphone, tablet, or computer with internet access.

Of the 223 participants who were eligible to participate in the study based on age, race, and gender, 5 (2.2%) were excluded due to self-reporting clinically diagnosed depression, 12 (5.3%) were excluded due to using tobacco products, 22 (9.8%) were excluded due to scoring moderate or severe on the Beck Depression Inventory (Beck, Steer, & Brown, 1996), 36 (16.1%) were excluded due to scoring moderate or severe on the Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988), and 7 (3.1%) were excluded due to scoring a 31 or higher (indicative of probable PTSD) on the Posttraumatic Stress Disorder Checklist (PTSD; Weathers et al., 2013).

The final sample included 141 participants who completed the online self-report measures (part one). Of those participants, 56 (39.7%) completed the baseline lab session (part two) and of those, 49 participants (34.7% of the total, 87% of the baseline Part Two lab sample) completed the longitudinal at-home phase (Part Three). Participants' ages ranged from 18 to 30 years of age (M = 21.16, SD = 2.46; see Appendix D).

Equipment and Measures

Screening measures.

Demographics and health. Age, race, socioeconomic status, and education were measured. SES was measured by asking household income ranges. Health measures were collected such as weight, height, current medications, current stress level, cardiovascular exercise activity, and recent caffeine consumption. Current medication was measured by asking "Are you currently taking any medications that affect your cardiovascular system, such as beta blockers?", "Are you currently taking any type of anti-depressant medication

(with or without a prescription; e.g., Lexapro, Cipralex, Paxil, Seroxat, Prozac, Luvox, Zoloft, or others)?" Depression, anxiety, and tobacco use were also measured to ensure eligibility for study. Depression, anxiety, and PTSD were measured by asking "Have you been diagnosed with depression (anxiety, PTSD) within the last six months?" If they responded "yes" respondents were not eligible for the study. In addition to answering self-report questions about recent depression, anxiety, and PTSD diagnoses, participants also completed inventories to measure for depression, anxiety, and PTSD (see Appendix C) and those meeting criterial were not eligible for the study.

Beck Depression Inventory-II. Depression was assessed using a 20-item measure (α = .85) using a scale from 0 (*I have not noticed any changes*) to 3 (*I have noticed many changes*; Beck, Steer, & Brown, 1996; see Appendix C). A sample item included, "Select the statement that best describes the way you have been feeling during the past two weeks, including today in regard to changes in sleeping patterns." Items were summed and participants scoring a 20 or higher (moderate and severe depression) were not eligible to participate in the study.

Beck Anxiety Inventory. Anxiety was assessed using a 20-item measure (α = .84) using a scale from 0 (*not at all*) to 3 (*severely-it bothers me a lot*; Beck, Epstein, Brown, & Steer, 1988; see Appendix C). A sample item included, "Indicate how much you have been bother by nervousness during the past month, including today?" Items were summed and participants scoring a 21 or higher (moderate and severe anxiety) were not eligible to participate in the study.

Posttraumatic Stress Disorder Checklist 5. Posttraumatic stress disorder was assessed using a 12-item measure (α = .90) from 0 (*not at all*) to 4 (*extremely*; Weathers

et al., 2013; see Appendix C). A sample item included, “How much have you been bother by irritable behavior, angry outbursts, or acting aggressively in the month?” Items were summed and participants scoring a 31 or higher (indicative of probable PTSD) were not eligible to participate in the study.

Trauma Checklist. Traumatic events were assessed using a 12-item measure (α = .58) from 1 (*yes*) to 0 (*no*; Wherry, Huffhines, & Walisky, 2016; see Appendix C). A sample item included, “Have you been in a bad accident, like a very serious car accident?” Items were added assess number of traumatic events participants have experienced such that higher values indicated more traumatic events.

Predictors.

Baseline frequency of exposure to positive and negative race-related media. Baseline frequency of exposure to positive and negative race-related media were assessed using two measures. The first assessed frequency of exposure on a 3-item scale from 1 (*never*) to 5 (*multiple times a day;* see Appendix C). A sample item included, “How often do you see social media coverage (e.g., Facebook, Twitter, etc.) about race-related topics (e.g., Black Lives Matter movement, confederate war monuments, etc.)?” The second assessed valence of race-related media on a 2-item scale from -2 (*very negative*) to 2 (*very positive*; see Appendix C). A sample item included, “In general, how would you rate the media (traditional and social) coverage of Black Americans?”

The items for frequency and the items for valence were independently averaged, so each participant had a score for frequency and a score for valence. The two scores were then multiplied so each participant had a single score for frequency of exposure to positive or negative race-related media such that lower negative numbers indicated more

frequent negative exposure and higher positive numbers indicated more frequent positive exposure (see Appendix D for distribution of scores). Because the frequency distribution was skewed, with no participants having infrequent exposure (of either valence), and only three participants reporting highly frequent positive exposure, the scores were collapsed into a dichotomous measure. Medium and high frequencies were combined to create two groups that only differed on valence. Participants with negative numbers were assigned a "0" for frequent exposure to negative race-related media and participants with a positive number where assigned a "1" for frequent exposure to positive race-related media.

Daily frequency of exposure to positive or negative race-related media. Daily frequency of exposure to positive or negative race-related media were assessed with slightly modified measures of baseline frequency of exposure to positive and negative race-related media described previously **(**see Appendix C). The same items were included, but the word "today" was added to each item. The same scoring procedure as baseline was used for daily exposure frequency and valence. Like the baseline measures, the frequency distribution was skewed, with no participants having infrequent exposure (of any valence), and no participants reporting daily high frequent positive exposure. Therefore, the scores were dichotomized such that participants with negative numbers were assigned a "0" for frequent daily exposure to negative race-related media and participants with a positive number where assigned a "1" for frequent daily exposure to positive race-related media. Day 1, day 2, and day 3 scores for exposure to positive or negative race-related media were calculated in the same manner, then averaged to create a daily mean score of frequently positive or negative exposure. The hypotheses were

modified to reflect these measures, and from this point forward, frequency is not a predictor variable, only valence of race-related media.

Moderators.

Trait self-esteem. Self-esteem was assessed using the 10-item Rosenberg (1965) measure (α = .88). Responses have a scale from 1 (*very strongly disagree*) to 6 (*very strongly agree*; see Appendix C). A sample item included, "I feel that I have a number of good qualities." Items were averaged such that higher values indicated greater self-esteem.

Optimism. Optimism was assessed using an 8-item measure (α = .78) with responses ranging from 1 (*very strongly disagree*) to 6 (*very strongly agree*; Scheier, Carver, & Bridges, 2001; see Appendix C). A sample item included, "I am hopeful about my future." All items were averaged such that higher values indicated greater optimism.

Perceived control. Perceived control was assessed using a 7-item scale (α = .60) with response options from 1 (*very strongly disagree*) to 6 (*very strongly agree*; Sparks, Guthrie, & Shepherd, 1997; see Appendix C). A sample item included, "I have little control over the things that happen to me." Items were averaged such that higher values indicated higher perceived control.

Ability to cope with discrimination. Ability to cope with discrimination was assessed using 4-items on a scale (α = .84) from 1 (*very strongly disagree*) to 6 (*very strongly agree*; adapted from Major, Richards, Cooper, Cozzarelli, & Zubek, 1998; see Appendix C). A sample item included, "I will be able to cope well with prejudice against Black Americans." Items were averaged such that higher values indicated greater ability to cope with discrimination.

Experiences with discrimination. Past experiences with discrimination was assessed using a 22-item measure (α = .94) with responses on a scale from 1 (*never happened to me*) to 5 (*happens very often*; Brondolo et al., 2005; see Appendix C). A sample item included, "Someone hinted you must be lazy because you are Black." Items were averaged such that higher values indicated more past experiences with discrimination.

Racial identity. Racial identity was assessed using a 21-item measure (α = .74) using a scale from 1 (*very strongly disagree*) to 6 (*very strongly agree*; Sellers, Smith, Shelton, Rowley, & Chavous, 1998; see Appendix C). A sample item included, "I am happy that I am Black." All items were averaged such that higher values indicated stronger racial identity.

Race rejection sensitivity. Race rejection sensitivity was assessed using a 12-item, two-part, questionnaire (α = .90). For the first part, participants indicated concern that a negative outcome would occur because of their race. Participants read scenarios and picture themselves in that situation. They indicated how they would feel in that situation from 1 (*very unconcerned*) to 6 (*very concerned*; Mendoza-Denton, Downey, Purdie, David, & Pietzak, 2002; see Appendix C). A sample item included, "Imagine that you are in class one day, and the professor asked a particularly difficult question. A few people, including yourself, raise their hands to answer the question. How concerned would you feel that the professor might not choose you because of your race/ethnicity?"

Participants then indicated the likelihood or expectation that someone else would show rejecting behaviors toward them as a result of their race. Participants indicated how much they would expect something to happen to them because of their race/ethnicity

from 1 (*very unlikely*) to 6 (*very likely;* Mendoza-Denton et al., 2002; see Appendix C). A sample item of this question included, "I would expect to receive a lower grade than others because of my race/ethnicity." Although research supports that conceptually the scales measure two different aspects of race-rejections sensitivity, concern and expectation are highly correlated (Mendoza-Denton, Downey, Purdie, David, & Pietzak, 2002). Therefore, all items were averaged to assess race-rejection sensitivity such that higher values indicated greater race-rejection sensitivity.

Activism orientation scale. Activism orientation was assessed using a 25-item scale (α = .96) from 1 (*extremely unlikely*) to 6 (*extremely likely*; Corning & Myers, 2013; see Appendix C). A sample item included, "How likely are you to engage in a race-related social justice activity?" Items were averaged such that higher values indicated greater activism orientation.

Health Outcomes as Mediators

Cortisol and DHEA. Cortisol and DHEA levels were assessed via saliva using the passive drool method which is a common method used to assess salivary cortisol and DHEA (Adams et al., 2015). Cortisol and DHEA levels were collected at baseline (part two) and at three points throughout the day for three consecutive days (part three). The baseline sample was collected in the lab between 11:45 AM and 4:00 PM. For the longitudinal portion of the study, sample one was collected immediately when waking, sample two was collected 30 minutes after waking, and sample three was collected right before bed. Participants were instructed not to eat, drink, or brush their teeth for at least 45 minutes before sampling. Saliva samples were frozen and stored at the participant's home at -20 degrees Celsius until collected by the researcher. Once collected, samples

were stored at -80 degrees Celsius until shipped on dry ice to Salimetrics where the samples were assayed.

Health Outcomes.

Perceived stress. Perceived stress was assessed using a 10-item scale (α = .70) rated from 1 (*never*) to 5 (*often*; Cohen, Kamarck, Mermelstein, 1994; see Appendix C). A sample item included, "How often to you find that you are not able to cope with all the things you have to do?" Items were averaged such that higher values indicated greater perceived stress.

State self-esteem. State self-esteem was assessed using reworded items from the 10-item Rosenberg (1965) measure (α = .88) to reflect current state rather than trait self-esteem. Responses ranged from 1 (*very strongly disagree*) to 6 (*very strongly agree;* see Appendix C). A sample item included, "Today, I feel that I have a number of good qualities." Items were averaged daily and then across three days such that higher values indicated higher daily state self-esteem.

Multiple affective adjective checklist. The multiple affective adjective checklist was used to measure affect. 8-items were answered (α = .70) on a scale from 1 (*never*) to 6 (*always*; Zuckerman & Lubin, 1985; see Appendix C). A sample item included, "Please indicate how frequently you experience excitement today." Items were averaged daily and then across three days such that lower values indicated greater daily affective distress and higher values indicated more daily positive affect.

Procedure

The study was approved by The University of Missouri- St. Louis Internal Review Board (see Appendix A). There were three parts to this study: Part one included a

45-minute online questionnaire and part two included a 30-minute lab session. After completing parts one and two, participants were asked if they would like to complete part three. Part three spanned 3-days and involved taking home supplies for participants to collect their own saliva samples at home over a 3-day period and take a nightly 15-minute questionnaire. The total time for part 3 was 90 minutes over the course of three days.

Part one. Participants first completed a 15-minute online pre-screening questionnaire to determine their eligibility on Qualtrics (Provo, Utah; see Appendix C). To screen for mental health concerns, participants first answered Yes/No questions about any diagnosis of depression, anxiety, or PTSD within the past 6 months. Those who selected "Yes" were directed to the closing screen. As a precaution, anyone who selected "No" to these questions also completed a brief measure of depression, anxiety, and PTSD symptomatology including the Beck Depression Inventory-II (Beck, Steer, & Brown, 1996), Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988), Posttraumatic Stress Disorder Checklist-5 (Weathers et al., 2013), and a trauma checklist (Wherry, Huffhines, & Walisky, 2016), respectively.

After ensuring eligibility, participants then completed an informed consent for the online questionnaire (see Appendix B). After, participants completed self-report measures including frequency of exposure to race-related media, trait self-esteem (Rosenberg, 1965), optimism (Scheier, Carver, & Bridges, 2001), perceived control (Sparks, Guthrie, & Shepherd, 1997), ability to cope with discrimination (adapted from Major, Richards, Cooper, Cozzarelli, & Zubek, 1998), past experiences with discrimination (Brondolo et al., 2005), racial identity (Sellers, Smith, Shelton, Rowley, &

Chavous, 1998), race rejection sensitivity (Mendoza-Denton, Downey, Purdie, David, & Pietzak, 2002), activism orientation scale (Corning & Myers, 2013), multiple affective adjective checklist (Zuckerman & Lubin, 1985), perceived stress scale (Cohen, Kamarck, Mermelstein, 1994), and demographics.

After completing part one, participants were scheduled for the part two lab appointment during the first two weeks of their menstrual cycle to control for hormonal differences in phases of the menstrual cycle. Participants were compensated with one Sona credit or $10 for the online survey.

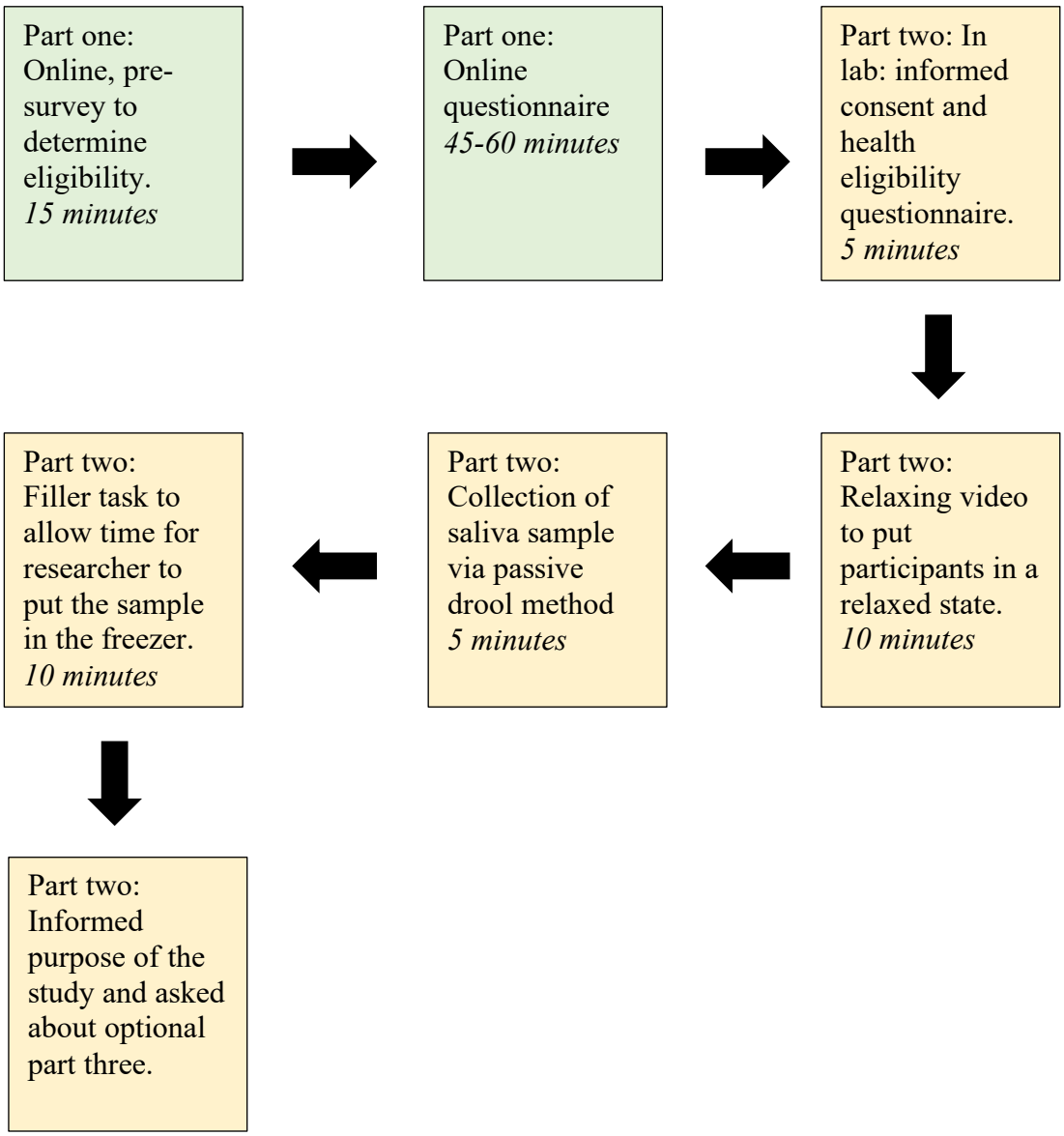
Part two. Women could participate in the online survey at any time, but only women in the follicular stage of their menstrual cycle (0 to 14 days after the onset of menstruation) were eligible to participate in the lab and longitudinal portions of the study to minimize the potential influence of monthly fluctuations in sex hormones (Mendes et al., 2008). Women who did not have regular menstrual cycles due to hormonal contraceptives or other health related reasons were able to participate in the lab and longitudinal study phases at any time during their menstrual cycle.

Participants were scheduled for their lab session to start between 11:30 AM and 3:30 PM to control for time of day differences in cortisol levels (Trawalter, Adam, Chase-Lansdale, & Richeson, 2012). The researcher first reviewed and obtained informed consent (See Appendix B). Participants completed a health questionnaire to ensure eligibility at the time of the study (e.g., no food or drink within 45 minutes) and to gather age and body mass index (BMI) to be used as covariates in the analyses (see Appendix C). In order to obtain a useable saliva sample, participants must have refrained from eating or drinking any fluids including water, brushing their teeth, or chewing gum or

candy within 45 minutes of entering the lab. If participants failed these criteria they were rescheduled and dismissed without credit or payment.

Participants who were eligible watched a 10-minute nature video to put them in a relaxed state. Participants were then prepared for collection of saliva using the passive drool method. Participants were shown how to collect saliva correctly and then asked to fill the via with 1mL of saliva. The samples were stored in a cryovial that was labeled with their participant ID number. Samples were immediately stored in a -80-degree Celsius freezer and were sent to Salimetrics within six months of collection to be processed. After providing the saliva sample, participants completed a 10-minute filler task to allow for enough time to elapse for the researcher to take the saliva sample and immediately store it in the -80-degree Celsius freezer (see Figure 5). Participants were then informed about the true purposes of the study immediately following the lab session and had all their questions answered. At this point they were told about the optional follow-up Part Three of the study and asked if they would like to participate. Participants were compensated with one and a half Sona credits or $10 for the lab session.

Figure 5. Part One and Part Two Study Timeline



Part three. If the participants wanted to participate in Part 3 of the study, they first filled out a part three informed consent (see Appendix B) and then they were scheduled to start data collection during the follicular stage of their menstrual cycle. Participants were given instructions on how to collect the samples at home and told at what time they should do so. They were scheduled to begin data collection on a Monday or Tuesday morning, during the follicular stage of their menstrual cycle, and collected

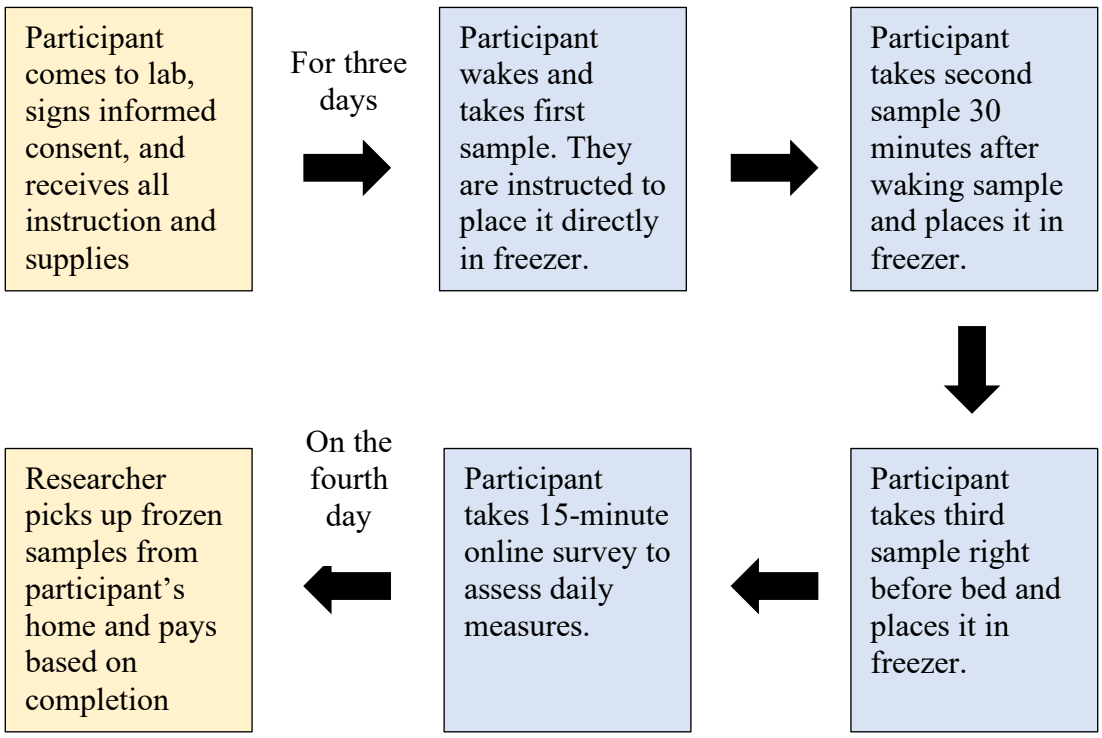
data over the following 3 days. Participants picked up all the supplies they needed for saliva collection from the lab including labeled vials, Saliva Collection Aids, and labeled Ziploc freezer bags. Like Part two, Participants were instructed to not eat, drink, or brush their teeth within 45 minutes before sampling. They were instructed to write down the date and time each of the samples were collected. They were told to put the samples in a freezer immediately after collection and leave the samples frozen until collected by the researcher. Participants were told to take a sample three times a day, one as soon as they wake up, one 30 minutes after waking, and one right before bed, for three consecutive days. To ensure participants remember to take each sample on time, the researcher texted reminders to the participant. The text messages were sent based on participants' self-report typical wake up time and bedtime throughout the week to their personal cellphone.

In addition to the night saliva sample, before bed participants were asked to complete a 15-minute online questionnaire on their daily media use, content of media exposure, and psychological health (see Appendix C). Measures include frequency of daily exposure to race-related media, daily perceived stress scale (Cohen, Kamarck, & Mermelstein, 1994), state self-esteem (Rosenberg, 1965), and multiple affective adjective checklist (Zuckerman & Lubin, 1985). Participants received multiple daily text reminders at each time point to take a saliva sample and to complete the nightly questionnaire. The times the text or email reminders were sent was predetermined by the participant when she picked up her supplies.

After three days, the researcher collected the samples from the participant's home and payment was given (see Figure 6). Payment was prorated based on degree of study completion at the rate of $5 per saliva sample (3 per day, up to 9, or $45) and $5 per

online questionnaire (up to 3, or $15), for a total of $60 possible compensation. Participants were ensured that missing a sample or a survey did not disqualify them from the study and if they missed a sample or survey, they should continue with the study at the next time point. Participants could opt for two and a half Sona credits instead, the equivalent to 90 minutes of participation.

Figure 6. Part Three Study Timeline



Data Preparation

All data were screened for univariate outliers by calculating the z-scores of each variable and for scores 2.95 standard deviations from the mean, that score was replaced with the most extreme remaining value in each tail (Howell, 2013). All data were then screened for multivariate outliers using Mahalanobis' Distance (Howell, 2013), no multivariate outliers were found. All cortisol and DHEA analyses controlled for age and

body mass index (BMI). Analyses of baseline levels of cortisol and DHEA also controlled for the time of day that the samples were taken. In hypothesis tests, the two predictor variables (e.g., baseline and daily frequent exposure to positive or negative race-related media) were entered as separate dichotomous independent variables (baseline and daily; see Table B1 and Table B2). State self-esteem was only an outcome for the daily analyses, because only trait, and not state, self-esteem was taken at baseline, Part 1. The PROCESS macro for SPSS 25 (Hayes, 2012) was used to test the proposed moderation (model 1), mediation (model 4), and moderated mediation (model 7) models. All simple slopes for significant or trending results are graphed at +1, mean and -1 standard deviations.

All saliva samples were assayed by Salimetrics' SalivaLab (Carlsbad, CA) using the Salimetrics Salivary Cortisol Assay Kit (Cat. No. 1-3002) and the DHEA Assay Kit (Cat. No. 1-1202), without modifications to the manufacturer's protocol. Samples were thawed to room temperature, vortexed, and then centrifuged for 15 minutes at approximately 3,000 RPM immediately before preforming the assay. Samples were tested for salivary DHEA and cortisol using a high sensitivity enzyme immunoassay. For cortisol testing, sample test volume was 25 ml of salvia per determination. The assay has a lower limit of sensitivity of .007mg/Dl, a standard curve ranges from 0.012-3.0 mg/Dl, and an average intra-assay coefficient of variation of 4.60% and an average inter-assay coefficient of variable 6.00%.

For DHEA testing, sample test volume was 50ml of saliva per determination. The assay has a lower limit of sensitivity of 5pg/mL, a standard cure ranges from 10.2-1000pg/ml, and an average intra-assay coefficient of variation of 5.55%, and an average

inter-assay coefficient of variation 8.20%. Both cortisol and DHEA testing meets the manufacturers' criteria for accuracy and reliability in salivary bioscience and exceeds the applicable NIH guidelines for Enhancing Reproducibility though Rigor and Transparency (Salimetrics, 2019).

Daily diurnal slope of cortisol and DHEA (slope) and cortisol and DHEA awakening response (CAR and DAR, respectively) were calculated. All cortisol values were natural log transformed before analysis to adjust for a strong positive skew in cortisol distribution (DeSantis et al., 2007). Slope was computed by taking the difference between awakening levels (sample 1) and bedtime levels (sample 3) and dividing by the minutes between samples ([sample 1- sample 3] / time between samples). Daily slope values were then averaged across the three days (Huynh et al., 2016) where a higher value corresponds to a steeper slope (more adaptive diurnal slope) and where lower values indicate a flatter slope (a sign of adrenal fatigue). Sample two was excluded from slope calculations due to prior work suggesting that sample two is highly correlated with the awakening response whereas excluding it from the calculations allowed for a more independent analysis of slope from the awakening response (DeSantis et al., 2007).

Cortisol awakening response and DHEA awakening response were computed by subtracting the 30-minute post-wake sample levels (sample 2) from the awakening levels (sample 1) and dividing by the minutes between the samples [(sample 1 - sample 2)/ time between samples]. Daily CAR and DAR values were then averaged across three days (Huynh et al., 2016) where more negative values indicated a greater awakening (more adaptive) response and where more positive values mean a more blunted awakening response.

Hypothesis Tests

Hypothesis 1

To test Hypothesis 1, correlations between cortisol and DHEA were computed separately for each group (frequent exposure to negative race-related media and frequent exposure to positive race-related media) to investigate if the valence of race-related media has a relationship with cortisol and DHEA correlation. Hypothesis 1a stated participants reporting frequent exposure to negative race-related media will show dysregulation (no correlation) of baseline cortisol and DHEA and participants reporting frequent exposure to positive race-related media will have a significant correlation of baseline cortisol and DHEA. Results show that baseline cortisol and DHEA were significantly correlated among participants reporting frequent exposure to negative race-related media, $r(34) = .475$, $p = .007$, but not among participants reporting frequent exposure to positive race-related media, $r(18) = .409$, $p = .092$. The results are contrary to the direction of the predicted relationship, therefore, Hypothesis 1a was not supported.

Hypothesis 1b proposed daily frequent exposure to negative race-related media will predict dysregulation of cortisol and DHEA diurnal slopes and daily frequent exposure to positive race-related media will predict a correlation between cortisol and DHEA slopes. Results indicated cortisol and DHEA slopes were significantly correlated among participants reporting daily frequent negative exposure to race-related media, $r(29) = .461$, $p = .009$, and among participants reporting daily frequent positive exposure to race-related media, $r(15) = .561$, $p = .019$, thus, Hypothesis 1b was partially supported.

Finally, Hypothesis 1c predicted that daily frequent exposure to negative race-related media will predict dysregulation (no correlation) of the cortisol and DHEA

awakening responses and daily frequent exposure to positive race-related media will predict a correlation between cortisol and DHEA awakening responses. Again, results show that this hypothesis was partially supported. The cortisol and DHEA awakening responses were significantly correlated among participants reporting daily frequent negative exposure to race-related media, $r(29) = .496$, $p = .005$, and among participants reporting daily frequent positive exposure to race-related media, $r(15) = .550$, $p = .022$, thus Hypothesis 1c was partially supported.

Hypothesis 2

To test Hypotheses 2a and 2b, that there will be main effects of frequent exposure to positive or negative race-related media on baseline cortisol and DHEA levels, linear regressions were computed. Results indicated a significant main effect of valence of race-related media on baseline cortisol, $F(1, 49) = 5.336$, $p = .024$, b = .254 , $R^2 = .099$, 95% CI [.035, .474], where frequent exposure to negative race-related media indicated lower levels of baseline cortisol ($M = -1.74$, $SD = .0721$) and frequent exposure to positive race-related media predicted higher levels of baseline cortisol ($M = -1.49$, $SD = .0712$), contrary to Hypotheses 2a and 2b. Results also indicated a significant main effect of frequent exposure to positive or negative race-related media on baseline DHEA, $F(1, 50) = 4.85$, $p = .032$, b = 53.197, $R^2 = .298$, 95% CI [4.72, 101.66], where frequent exposure to negative race-related media predicted lower baseline DHEA ($M = 257.50$, $SD = .14.52$) and frequent exposure to positive race-related media predicted higher baseline DHEA levels ($M = 310.70$, $SD = 19.36$). Results suggest that cortisol and DHEA are higher in participants reporting frequent exposure to positive race-related media than participants

reporting frequent exposure to negative race-related media therefore, Hypotheses 2a and 2b were not supported.

To test Hypotheses 2c and 2d, linear regressions were used to investigate the main effects of daily frequent exposure to positive or negative race-related media on diurnal cortisol and DHEA slopes. Results showed no significant relationship between daily frequent exposure to positive or negative race-related media and cortisol slopes, $F(1, 46) = .731$, $p = .387$, $R^2 = .016$, or DHEA slopes, $F(1, 46) = .001$, $p = .980$, $R^2 < .001$, contrary to Hypothesis 2c and Hypothesis 2d.

Finally, to test the main effects of daily frequent exposure to negative race-related media on the cortisol awakening response (Hypothesis 2e) and the DHEA awakening response (Hypothesis 2f), linear regressions were used. Results indicated no significant main effects for the cortisol awakening response, $F(1, 46) = 1.80$, $p = .186$, $R^2 = .038$, or the DHEA awakening response, $F(1, 46) = .301$, $p = .260$, $R^2 = .007$, thus, Hypotheses 2e and 2f were not supported.

Hypothesis 3

To test the moderation model proposed in Hypothesis 3, multiple regression analyses were used. Hypothesis 3a stated the relationship between race-related media (e.g., baseline and daily frequent exposure to positive or negative race-related media) and cortisol and DHEA levels (e.g., baseline, slopes, and awakening responses) will be moderated by trait self-esteem. Hypothesis 3a.1. Regression analyses indicated no significant effects for the interaction between baseline frequent exposure to positive or negative race-related media and trait self-esteem on baseline cortisol, model: $F(6, 39) = 1.593$, $p = .0342$, $R^2 = .197$, interaction: b = .0901, $p = .450$, $\Delta R^2 = .0109$. Results also

indicated no significant relationship on baseline DHEA levels, model: $F(6, 39) = .822$, $p = .559$, $R^2 = .112$ (see Table E1 for interaction), thus Hypothesis 3a.1 was not supported. Further, for Hypothesis 3a.2, regression analyses showed no significant interactions between daily frequent exposure to positive or negative race-related media and trait self-esteem on cortisol slope, model: $F(5, 42) = 1.463$, $p = .222$, $R^2 = .148$, DHEA slope, model: $F(5, 42) = 1.497$, $p = .211$, $R^2 = .151$, the cortisol awakening response, model: $F(5, 42) = 1.065$, $p = .392$, $R^2 = .112$ or the DHEA awakening response, model: $F(5, 42) = .953$, $p = .456$, $R^2 = .106$, therefore none of the components of Hypothesis 3a were supported (see Table E2 for interactions).

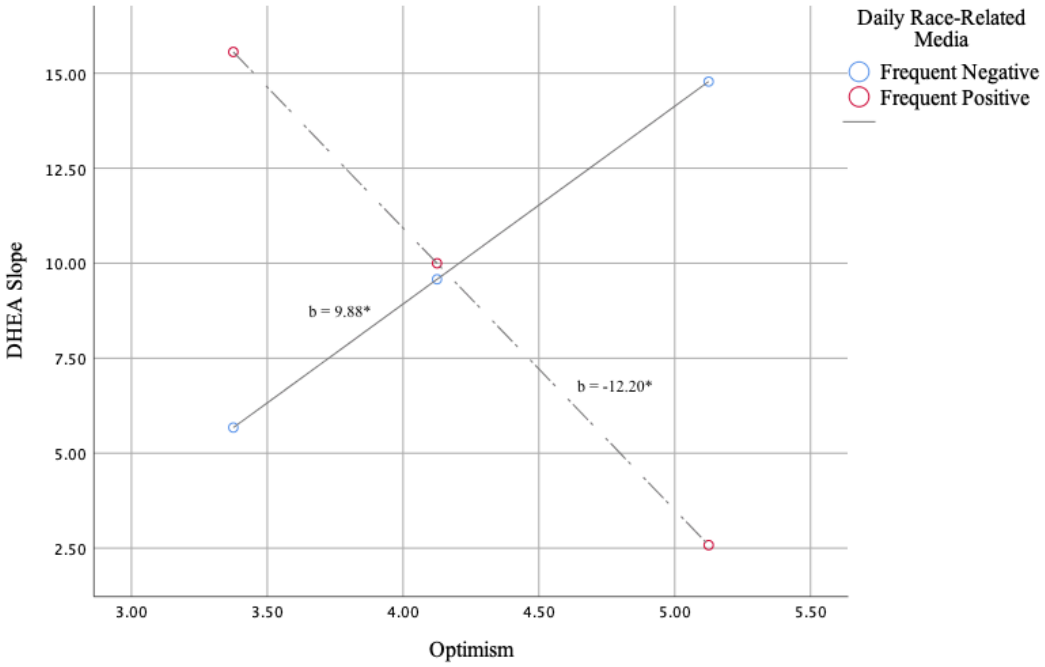
Hypothesis 3b stated the relationship between frequent exposure to positive or negative race-related media and biological outcomes will be moderated by optimism. For Hypothesis 3b.1, regression analyses showed no significant two-way interactions between baseline frequent exposure to race-related media content and optimism on baseline cortisol, model: $F(6, 39) = 2.198$, $p = .0637$, $R^2 = .252$, interaction: b = .0745, $p = .644$, $\Delta R^2 = .0041$, or baseline DHEA, model: $F(6, 39) = 1.310$, $p = .275$, $R^2 = .167$, Therefore, Hypothesis 3b.1 was not supported (see Table E3 for interactions).

3b.2. Regression analyses was used to test the moderating effects of optimism on the relationship between daily frequent exposure to positive or negative race-related media and cortisol slope, DHEA slope, CAR, and DAR. Regression analysis indicated a trending relationship between daily frequent exposure to race-related media and optimism on cortisol slope, model: $F(5, 42) = 1.547$, $p = .195$, $R^2 = .155$, interaction: b = -.0419, $p = .0229$, $\Delta R^2 = .112$ (see Table E4) such that among women with higher optimism, frequent exposure to negative race-related media predicted a flatter cortisol slope

(b = 5.125, SE = .211, p = .0222, ΔR^2 = .112, 95% CI [.-0927, -.0075]) compared to women reporting frequent exposure to positive race-related media. Results were not significant among women reporting lower optimism (b = .0233, SE = .0202, p = .254 ΔR^2 = .112, 95% CI [-.0174, .0640]). This trending relationship contrasts with the proposed relationship between optimism and diurnal cortisol slope.

Results also indicated a marginally significant moderating effect of optimism on the relationship between positive or negative race-related media and DHEA slope, model: F(5, 42) = 2.318, p = .0601, R^2 = .216, interaction: b = -12.622, p = .0049, ΔR^2 = .164. Simple slopes analysis indicated that among women with reporting daily frequent negative exposure to race-related media, lower optimism predicted a flatter DHEA diurnal slope (b = 9.887, SE = 4.826, p = .0468, ΔR^2 = .164, 95% CI [.1460, 19.6280]) compared to women with higher optimism. Simple slope analysis also indicated that among women reporting daily frequent exposure to positive race-related media lower optimism predicted a steeper DHEA diurnal slope (b = -12.301, SE = 5.0476, p = .0200, ΔR^2 = .164, 95% CI [-22.3897, -2.0165]) compared to women reporting higher optimism. These results suggest that optimism may be a protective factor against frequent exposure to negative race-related media (see Figure 7).

Figure 7. The Effect of Exposure to Positive or Negative Race-Related Media and Optimism on Diurnal DHEA Slope



Notes. *$p < .05$

Regression analyses indicated no significant effects between daily frequent exposure to positive or negative race-related media and optimism on the cortisol awakening response, model: $F(5, 42) = 1.302$, $p = .281$, $R^2 = .134$, or the DHEA awakening response, model: $F(5, 42) = 1.008$, $p = .425$, $R^2 = .107$. Thus, Hypothesis 3b.2 was partially supported (see Table E4 for interactions).

Hypothesis 3c proposed that the relationship between frequent exposure to positive or negative race-related media and biomarkers (e.g., baseline, slopes, and awakening responses) will be moderated by perceived control. Regression analyses indicated that baseline cortisol, model: $F(5, 42) = 2.291$, $p = .0612$, $R^2 = .203$, interaction: b = .0538, $p = .805$, $\Delta R^2 = .0011$, or baseline DHEA, model: $F(6, 39) = 1.256$, $p = .299$,

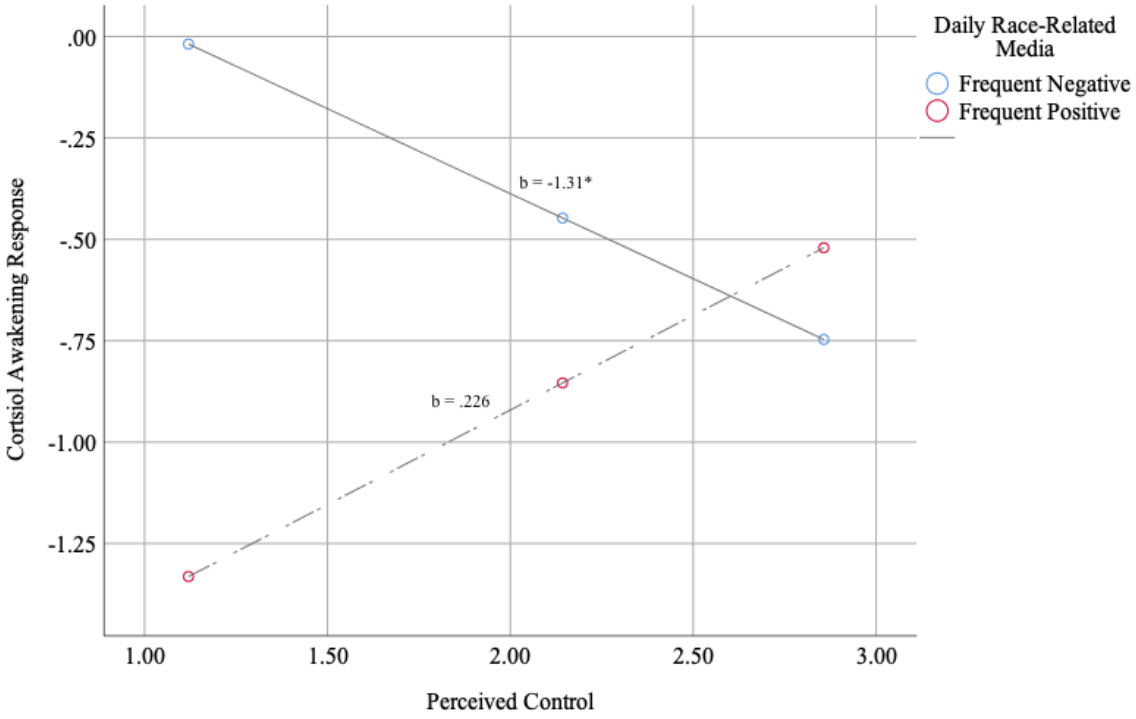
R^2 = .162 were not significant, therefore Hypothesis 3c.1was not supported (see Table E5 for interactions).

Regression analyses was used to test the interaction between frequent exposure to positive or negative race-related media and perceived control on cortisol slope, DHEA slope, CAR, and DAR (Hypothesis 3c.2). Analyses indicated a trending relationship with cortisol slope, model: $F(5, 42) = 1.661$, $p = .165$, $R^2 = .165$, interaction: b = .0578, p = .0117, $\Delta R^2 = .138$. Simple slopes analysis indicated that among women reporting lower perceived control, frequent exposure to negative race-related media predicted flatter diurnal slopes compared to women reporting daily frequent exposure to positive race-related media (b = -.0697, SE = .0256, p = .0095, $\Delta R^2 = .1381$, C.I. [-.1215, -.0180]). The relationship was not significant for women reporting higher perceived control (b = .0306, SE = .0213, p = .157, $\Delta R^2 = .138$, 95% CI [-.0123, .0736]). These results are trending in the direction predicted by Hypothesis 3c.2.

Analyses indicated no significant effects of frequent exposure to positive or negative race-related media and perceived control on DHEA slope, model: $F(5, 42)$ = .726, p = .607, R^2 = .0796 (see Table E6 for interaction). Results did indicated a marginally significant interaction between frequent exposure to positive or negative race-related media and perceived control on the cortisol awakening response, model: $F(5, 42)$ = 2.416, p = .0517, R^2 = .223, interaction: b = .886, p = .0436, $\Delta R^2 = .0800$. Simple slopes analysis indicated that among women with lower perceived control, frequent exposure to daily negative race-related media predicted a blunted cortisol awakening response compared to women with greater frequent exposure to positive race-related media (b = -1.312, SE = .498, p = .0117, $\Delta R^2 = .0800$, 95% CI [-2.3186, -.3073]). Effects were not

significant for women higher in perceived control (b = .226, SE = .413, p = .587, ΔR^2 = .0800, 95% CI [-.6077, 1.0600]; see Figure 8). These results suggest that women with lower perceived control are exhibiting adrenal fatigue in response to frequent exposure to negative race-related media compared to women reporting frequent exposure to daily positive race-related media, thus, Hypothesis 3c was partially supported.

Figure 8. The Effect of Exposure to Positive or Negative Race-Related Media and Perceived Control on the Cortisol Awakening Response



Notes. *p < .05

Finally, analysis indicated no significant effects of frequent exposure to positive or negative race-related media and perceived control on DHEA awakening response, model: $F(5, 42) = 1.228$, p = .312, R^2 = .127 Therefore, Hypothesis 3c was partially supported (see Table E5 for interaction).

Hypothesis 3d was tested using multiple regression and predicted a significant relationship between frequent exposure to positive or negative race-related media and ability to cope with discrimination on cortisol and DHEA baseline levels, slopes, and awakening responses. To test Hypothesis 3d.1, regression analyses were computed and indicated no significant interactions between baseline frequent exposure to positive or negative race-related media and ability to cope with discrimination on baseline cortisol, model: $F(6, 39) = 2.096$, $p = .0757$, $R^2 = .243$, interaction: b = -.0540, $p = .615$, $\Delta R^2 = .0050$, or baseline DHEA, model: $F(6, 39) = 1.223$, $p = .315$, $R^2 = .158$, thus Hypothesis 3d.1 was not supported (see Table E7 for interaction).

Hypothesis 3d.2. Regression analyses showed no significant relationship for the interaction between daily frequent exposure to positive or negative race-related media and ability to cope with discrimination on cortisol slope, model: $F(5, 42) = .525$, $p = .755$, $R^2 = .0589$, DHEA slope, model: $F(5, 42) = 1.084$, $p = .383$, $R^2 = .114$, the cortisol awakening response, model: $F(5, 42) = 1.067$, $p = .392$, $R^2 = .112$, or the DHEA awakening response, model: $F(5, 42) = 1.207$, $p = .322$, $R^2 = .125$, therefore, Hypothesis 3d.2 was not supported (see Table E8 for interactions).

Hypothesis 3e proposed the relationship between race-related media (e.g., baseline frequent exposure to positive or negative race-related media and daily frequent exposure to positive or negative race-related media) and cortisol and DHEA levels (e.g., baseline, slopes, and awakening responses) will be moderated by past experiences with discrimination. First, regression analyses indicated no significant interactions between baseline daily frequent exposure to positive or negative race-related media and past experiences with discrimination on baseline cortisol, model: $F(6, 39) = 2.852$, $p = .0212$,

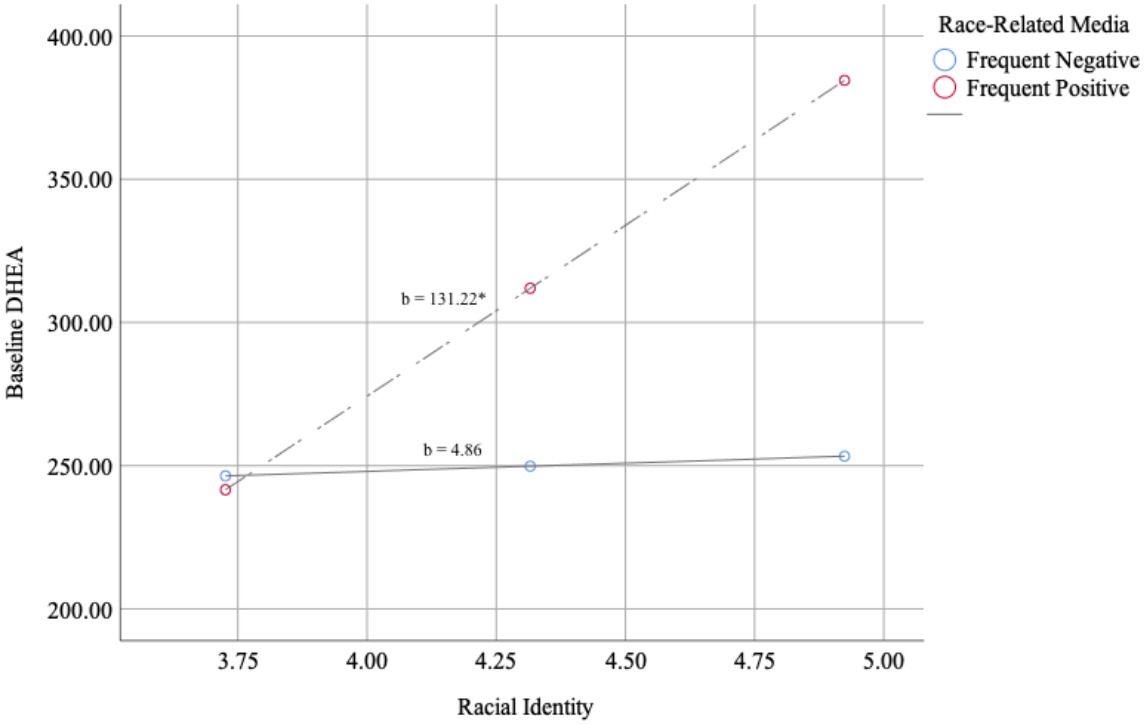
R^2 = .306, interaction: b = -.283, p = .211, ΔR^2 = .0288, or baseline DHEA, model: F(6, 39) = .973, p = .455, R^2 = .130. Therefore, Hypothesis 3e.1 was not supported (see Table E9 for interaction).

Regression analyses also indicated no significant interactions between daily frequent exposure to positive or negative race-related media and past experiences with discrimination on cortisol slope, model: F(5, 42) = .628, p = .264, R^2 = .0696, DHEA slope, model: F(5, 42) = .529, p = .752, R^2 = .0593, the cortisol awakening response, model: F(5, 42) = 1.358, p = .259, R^2 = .139, or the DHEA awakening response, model: F(5, 42) = 1.348, p = .263. R^2 = .138. Thus, Hypothesis 3e.2 was not supported (see Table E10 for interactions).

Regression analyses were used to test the moderating effects of racial identity on the frequent exposure to positive or negative race-related media (baseline and daily) and baseline cortisol and DHEA, cortisol and DHEA slope, and the cortisol and DHEA awakening response (Hypothesis 3f). For Hypothesis 3f.1, regression analysis on baseline cortisol, model: F(6, 39) = 2.039, p = .0834, R^2 = .238, interaction: b = .0977, p = .667, ΔR^2 = .0037, yielded no significant effects (see Table E11). However, results showed a significant interaction between baseline frequent exposure to positive or negative race-related media and racial identity on baseline DHEA, model: F(6, 39) = 2.377, p = .0471, R^2 = .267, interaction: b = 113.587, p = .0233, ΔR^2 = .194, (see Table E11). Simple slopes analysis indicated that among women with higher racial identity, frequent exposure to positive race-related media predicted higher levels of baseline DHEA compared to women reporting frequent exposure to negative race-related media (b = 131.221, SE = 43.19,9 p = .0042, ΔR^2 = .194, 95% CI [43.386, 218.596]). There were no significant

effects for women reporting lower racial identity (b = -4.861, SE = 68.832, p = .985, ΔR^2 = .194, 95% CI. [-79.363, 69.641]; see Figure 9). These results suggest that women with higher racial identity are exhibiting higher DHEA levels in response to frequent exposure to positive race-related media compared to participants reporting frequent exposure to negative race-related media, suggesting racial identity is a protective individual difference variable and partially supporting Hypothesis 3f.1.

Figure 9. The Effect of Frequent Exposure to Positive or Negative Race-Related Media and Racial Identity on Baseline DHEA.



Notes. *p < .05

Hypothesis 3f.2. Regression analyses on daily frequent exposure to positive or negative race-related media showed no significant two-way interactions between frequent race-related media exposure and racial identity on cortisol slope, model: $F(5, 42)$ = .963, p = .451, R^2 = .102, DHEA slope, model: $F(5, 42)$ = 1.0036, p = .427, R^2 = .106, the

cortisol awakening response, model: $F(5, 42) = 1.200$, $p = .325$, $R^2 = .125$, or the DHEA awakening response, model: $F(5, 42) = 1.241$, $p = .307$, $R^2 = .128$, therefore, Hypothesis 3f was partially supported (see Table E12 for interactions).

Hypothesis 3g proposed the relationship between baseline frequent exposure to positive or negative race-related media and daily frequent exposure to positive or negative race-related media, and cortisol and DHEA levels (e.g., baseline, slopes, and awakening responses) will be moderated by race-rejection sensitivity. For the first part of Hypothesis 3g (3g.1), regression analyses yield no significant two-way interactions between race-related media and race-rejection sensitivity on baseline cortisol, model: $F(6, 39) = 2.176$, $p = .0662$, $R^2 = .250$, interaction: b = -.105, $p = .459$, $\Delta R^2 = .0107$, or baseline DHEA, model: $F(6, 39) = 1.300$, $p = .279$, $R^2 = .167$, therefore, Hypothesis 3g.1 was not supported (see Table E13for interactions)

Hypothesis 3g2. Regression analyses showed no significant two-way interactions between daily frequent exposure to positive or negative race-related media and race rejection sensitivity on cortisol slope, model: $F(5, 42) = .355$, $p = .875$, $R^2 = .0406$, DHEA slope, model: $F(5, 42) = .389$, $p = .853$, $R^2 = .0443$, the cortisol awakening response, model: $F(5, 42) = 1.627$, $p = .173$, $R^2 = .162$, interaction: b = -.337, $p = .273$, $\Delta R^2 = .0246$, or the DHEA awakening response, model: $F(5, 42) = 1.338$, $p = .267$, $R^2 = .137$. Thus, Hypothesis 3g was not supported (see Table E14 for interactions).

A final hypothesis was tested on individual differences moderating the relationship between frequent exposure to positive or negative race-related media and biomarkers at baseline and daily. Hypothesis 3h stated that activism orientation will moderate the relationship between race-media and biological outcomes. For Hypothesis

3h.1, regression analyses yield no significant two-way interaction between frequent exposure to positive or negative race-related media and activism orientation on baseline cortisol, model: $F(6, 39) = 2.156$, $p = .0685$, $R^2 = .249$, interaction: b = .0500, $p = .700$, $\Delta R^2 = .0029$, or baseline DHEA, model: $F(6, 39) = .953$, $p = .469$, $R^2 = .127$. Thus, Hypothesis 3h.1 regarding baseline biomarkers was not supported (see Table E15 for interactions).

Hypothesis 3h.2. Regression analyses showed no significant two-way interactions between daily frequent exposure to positive or negative race-related media and activism orientation on cortisol slope, model: $F(5, 42) = .784$, $p = .567$, $R^2 = .0854$. Results indicated a trending effect on DHEA slope, model: $F(5, 42) = 1.638$, $p = .170$, $R^2 = .163$, interaction: b = -6.571, $p = .0610$, $\Delta R^2 = .0739$. Although not significant, women lower in activism had slightly flatter diurnal slope with frequent exposure to negative race-related media than women lower in activism reporting frequent positive exposure to race-related media ($b = 5.171$, $SE = 4.236$, $p = .229$, $\Delta R^2 = .0739$, 95% CI [-3.379, 13.721]). The relationship is also not significant for women reporting higher activism ($b = -4.121$, $SE = 4.191$, $p = .331$, $\Delta R^2 = .0739$, 95% CI [-12.578, 4.334]). Results indicated no significant effects for the cortisol awakening response, model: $F(5, 42) = 1.518$, $p = .204$, $R^2 = .153$, or the DHEA awakening response, model: $F(5, 42) = 1.422$, $p = .236$, $R^2 = .144$, therefore, Hypothesis 3h was not supported (see Table E16 for interactions).

Hypothesis 4

To test Hypotheses 4a, 4b, and 4c, that there will be a main effect of daily frequent exposure to positive or negative race-related media on daily self-reported stress, daily state self-esteem, and daily affect, linear regressions were computed. Results

indicated a trending main effect of daily frequent exposure to positive or negative race-related media on self-reported stress, $F(1, 46) = 2.747$, $p = .104$, b = -.313, $R^2 = .056$, 95% CI [-.6931, .0673], where participants reporting daily frequent exposure to negative race-related media reported more daily perceived stress ($M = 2.45$, $SD = .112$) than those reporting daily frequent exposure to positive race-related media ($M = 2.13$, $SD = .142$), thus trending in the direction of Hypothesis 4a.

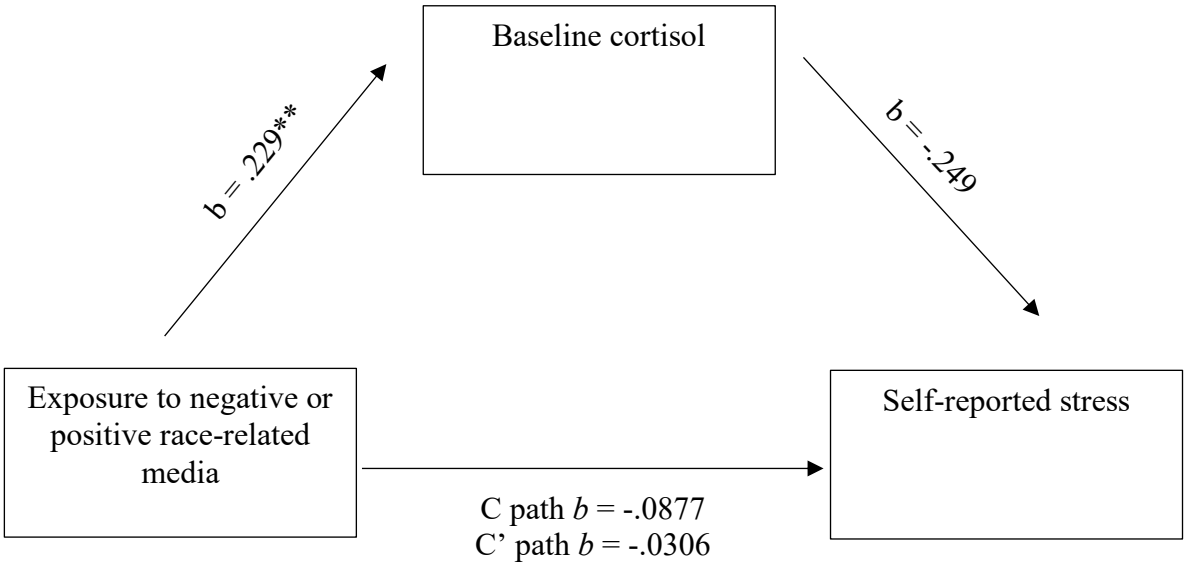
Results showed no significant main effect of daily valence of race-related media on state self-esteem $F(1, 46) = .062$, $p = .804$, $R^2 = .001$,therefore, Hypothesis 4b was also not supported. A final linear regression was used to test Hypothesis 4c and yielded a significant main effect of daily frequent exposure to positive or negative race-related media on daily positive affect, $F(1, 46) = 4.30$, $p = .044$, b = .354, $R^2 = .086$, 95% CI [.010, .697], where participants reporting daily frequent exposure to negative race-related media had less daily positive affect ($M = 4.12$, $SD = .098$) than those reporting daily frequent exposure to positive race-related media ($M = 4.47$, $SD = .145$), thus supporting Hypothesis 4c.

Hypothesis 5 Baseline Data

The PROCESS Macro (Hayes, 2012) was used to examine the mediation effects of baseline cortisol and DHEA levels on the pathway from baseline frequent exposure to positive or negative race-related media and self-reported stress and affect. Confidence intervals of mediation indirect effects were computed using 1,000 bootstrapped samples for each analysis. If bootstrapped confidence intervals for the indirect effect estimates did not contain zero, then the mediation model was significant.

A mediation analysis examined cortisol as a mediator between baseline frequent exposure to positive or negative race-related media and baseline self-reported stress (Hypothesis 5a; see Figure 10). The model testing frequent exposure to race-related media predicting baseline cortisol was significant, $F(4, 41) = 3.647$, $p = .0124$, $R^2 = .262$, and there was a marginally significant relationship between baseline exposure to media and baseline cortisol (path a), $t(41) = 1.967$, $p = .0559$, b = .229 suggesting that there is a main effect of frequency of exposure to positive or negative race-related media on baseline cortisol levels. The model testing baseline cortisol predicting baseline self-reported stress was marginally significant, $F(5, 40) = 2.207$, $p = .0725$, $R^2 = .216$, suggesting a main effect of baseline cortisol levels on self-reported stress levels, however, baseline cortisol levels did not significantly predict baseline self-reported stress (path b), $t(40) = -1.243$, $p = .221$, b = -.249. The total effect (path c) was not significant, $b = -.0877$, $p = .563$, the direct effect was not significant (path c'), $b = -.0306$, $p = .846$, and the indirect effect (ab) was also not significant, $b = -.0572$, 95% CI [-.2042, .0332], therefore, Hypothesis 5a, was only partially supported.

Figure 10. Model Examining Baseline Cortisol as a Mediator Between Frequent Exposure to Positive or Negative Race-Related Media and Self-Reported Stress at Baseline.



Note. ** $p < .06$

Similar mediation analysis examined baseline cortisol as a mediator between frequent exposure to positive or negative race-related media and baseline affect (Hypothesis 5b). The model testing baseline frequent exposure to race-related media predicting baseline cortisol was significant, $F(4, 41) = 3.647$, $p = .0124$, $R^2 = .262$ and there was a marginally significant relationship between exposure to media and baseline cortisol (path a), $t(41) = 1.967$, $p = .0559$, b = .229, again suggesting that there is a main effect of frequency of exposure to positive or negative race-related media on baseline cortisol levels. The model testing baseline cortisol and baseline affect was not significant, $F(5, 40) = .668$, $p = .649$, $R^2 = .0771$. Baseline cortisol did not significantly predict baseline affect (path b), $t(40) = .320$, $p = .750$, b = .105. The total effect was not significant (path c), b = -.137, $p = .573$, the direct effect (path c') was not significant, $b =$

-.161, p = .531, and the indirect effect (ab) was also not significant, b = .0241, 95% CI [-.1382, .2101], contrary to Hypothesis 5b.

Mediation analysis examined baseline DHEA as a mediator between frequent exposure to positive or negative race-related media and baseline self-reported stress (Hypothesis 5c). The model testing baseline frequent exposure to race-related media predicting baseline DHEA was not significant, $F(4, 41) = 1.482$, p = .225, R^2 = .126, however, there was a marginally significant relationship between race-related media and baseline DHEA (path a), $t(41) = 1.853$, p = .0710, b = 54.439, suggesting a main effect of frequency of exposure to positive or negative race-related media on baseline DHEA levels. The model testing baseline DHEA predicting baseline self-reported stress was not significant, $F(5, 40) = 1.847$, p = .125, R^2 = .187. There was no significant relationship between DHEA and baseline stress (path b), $t(40)$ = -.0420, p = .966, b = .0001. Further, the total effect (path c) was not significant, b = -.0851, p = .570, the direct path (path c') was not significant (b = -.0833, p = .598) and the indirect path (ab) was also not significant, b = -.0018, 95% CI [-.0978, .0931], thus Hypothesis 5c was not supported.

The final mediation analysis examined baseline DHEA as a mediator between frequent exposure to positive or negative race-related media and affect (Hypothesis 5d). Again, the model testing baseline frequent exposure to race-related media predicting baseline DHEA was not significant, $F(4, 41) = 1.48$, p = .225, R^2 = .126, however, there was a marginally significant relationship between race-related media and baseline DHEA (path a), $t(41) = 1.853$, p = .0710, b = 54.439, suggesting a main effect of frequency of exposure to positive or negative race-related media on baseline DHEA levels. The model testing baseline DHEA levels predicting baseline affect was not significant, $F(5, 40)$ =

.474, p =.792, R^2 = .0560. There was no significant relationship between baseline DHEA and baseline affect (path b), $t(40)$ = .612, p = .544, b = .0008. The total effect (path c) was not significant, b = -.0284, p = .908, the direct effect (path c'; b = -.0724, p = .781) and indirect effect (ab) was also not significant, b = .0440, 95% CI [-.0900, .2271], therefore, Hypothesis 5d was not supported.

Hypothesis 6 Daily Data

Hypothesis 6 was tested like Hypothesis 5 using a mediation model where the relationship between daily frequent exposure to positive or negative race-related media and daily self-reported health outcomes (e.g., daily self-reported stress, daily state self-esteem, and daily affect) will be mediated by daily biological factors (e.g., cortisol and DHEA slopes and the awakening responses).

Hypothesis 6a stated that cortisol slope will mediate the relationship between daily frequent exposure to positive or negative race-related media and daily self-reported stress. The model testing daily positive or negative race-related media did not significantly predict cortisol slope, $F(3, 44)$ = .399, p = .753, R^2 = .0265. There was not a significant relationship between daily race-related media and daily cortisol slope (path a), $t(44)$ = -.895, p = .375, b = -.0127. The model testing cortisol slope did not significantly predict daily stress (path b), $F(4, 43)$ = 1.055, p = .390, R^2 = .0894. There was not a significant relationship between daily cortisol slope and daily self-reported stress (path b), $t(43)$ = 1.123, p = .267, b = 2.377. The total effect (path c) was not significant, b = -.284, p = .162. Further, the direct effect (path c'), b = -.254, p = .213, and the indirect effect (ab) were not significant, b = -.0302, 95% CI [-.1966, .0621], therefore Hypothesis 6a was not supported.

Hypothesis 6b stated that cortisol slope will mediate the relationship between frequent exposure positive or negative race-related media and daily state self-esteem. As stated, the model testing daily positive or negative race-related media did not significantly predict cortisol slope, $F(3, 44) = .399$, $p = .753$, $R^2 = .0265$. There was not a significant relationship between daily race-related media and daily cortisol slope (path a), $t(44) = -.895$, $p = .375$, b = -.0127. The model testing cortisol slope predicting daily state self-esteem was not significant, $F(4, 43) = .184$, $p = .945$, $R^2 = .0169$. There was not a significant relationship between cortisol slope and state self-esteem (path b), $t(43) = .687$, $p = .495$, b = 1.623. The total effect was not significant (path c), $b = .0128$, $p = .954$. The direct (path c'), $b = .0335$, $p = .882$, and indirect effect (ab) was also not significant, $b = -.0207$, 95% CI [-.1679, .0823], thus Hypothesis 6b was not supported.

To test Hypothesis 6c, a similar mediation analysis examined cortisol slope as a mediator between frequent exposure to positive or negative race-related media and daily affect. The model testing daily positive or negative race-related media did not significantly predict cortisol slope, $F(3, 44) = .399$, $p = .753$, $R^2 = .0265$. There was not a significant relationship between daily race-related media and daily cortisol slope (path a), $t(44) = -.895$, $p = .375$, b = -.0127. The model predicting the relationship between cortisol slope and daily affect was not significant, $F(4, 43) = 1.355$, $p = .265$, $R^2 = .111$. There was no relationship between cortisol slope and affect (path b), $t(43) = -.618$, $p = .539$, b = -1.187. The total effect was marginally significant (path c), $b = .307$, $p = .0940$ suggesting an effect of frequent exposure to positive or negative race-related media on daily affect when removing the mediation effect of cortisol slope. The direct (path c'), *b*

= .292, p = .116, and indirect effect (ab), b = .0151, 95% CI [-.0621, .1217], were not significant, contrary to Hypothesis 6c.

Hypothesis 6d tested DHEA slope as a mediator of daily frequent exposure to positive or negative race-related media and daily self-reported stress. The model predicting the relationship between daily race-related media and DHEA slope was not significant, $F(3, 44) = .614$, $p = .609$, $R^2 = .0402$. There was not a significant relationship between race-related media and DHEA slope (path a), $t(44) = -.251$, $p = .803$, b = -.879. The model of DHEA slope predicting self-reported stress was not significant, $F(4, 43) = 1.655$, $p = .177$, $R^2 = .133$, however DHEA slope did marginally predict daily stress (path b), $t(43) = 1.87$, $p = .0676$, b = .0157, suggesting a main effect of DHEA slope on daily self-reported stress. The total effect (path c) was not significant, $b = -.284$, $p = .162$. The direct effect (path c') was not significant, $b = -.270$, $p = .171$, and the indirect effect (ab) was also not significant, b = -.0138, 95% CI. [-.1395, .1170], therefore, Hypothesis 6d was not supported.

Hypothesis 6e was tested like Hypothesis 6d and again, the model predicting the relationship between daily race-related media and DHEA slope was not significant, $F(3, 44) = .614$, $p = .609$, $R^2 = .0402$. There was not a significant relationship between race-related media and DHEA slope (path a), $t(44) = -.250$, $p = .803$, b = -.879. The model of the relationship between DHEA slope and state self-esteem was not significant, $F(4, 43) = 1.551$, $p = .205$, $R^2 = .126$, however, DHEA slope did significantly predict state self-esteem (path b), $t(43) = 2.431$, $p = .0193$, b = .0220, suggesting a main effect of DHEA slope on daily state self-esteem. The total effect was not significant, $b = .0128$, $p = .954$, the direct effect (path c') was not significant ($b = .0321$, $p = .879$), and the indirect effect

(ab) was not significant as well, b = -.0193, 95% CI [-.1875, .1605], thus Hypothesis 6e was not supported.

A final mediation model was tested with DHEA slope as the meditator (Hypothesis 6f). Again, the model testing the relationship between daily race-related media and DHEA slope was not significant, $F(3, 44) = .614$, $p = .609$, $R^2 = .0402$. Race-related media did not predict DHEA slope (path a), $t(44) = -.250$, $p = .803$, b = -.879. The model testing the relationship between DHEA slope and daily affect was not significant, $F(4, 43) = 1.277$, $p = .293$, $R^2 = .106$. DHEA slope did not predict daily affect (path b), $t(43) = -.323$, $p = .747$, b = -.0025. The total effect (path c) was marginally significant, $b = .307$, $p = .0940$, and the direct path from daily race-related media to daily affect (path c') was also marginally significant, ($b = .305$, $p = .100$). These results suggest that there is a marginally significant effect of frequent exposure to positive or negative race-related media on daily affect when removing the mediation effect of DHEA slope and there is a marginally significant effect of frequent exposure to positive or negative race-related media on daily affect when adding in the mediation effect of DHEA slope. The indirect path (ab) was not significant, $b = .0022$, 95% CI. [-.0524, .0563], contrary to Hypothesis 6f.

Hypotheses 6g, 6h, and 6i stated that the cortisol awakening responses will mediate the relationship between daily frequent exposure to positive or negative race-related media and 6g) self-reported stress, 6h) state self-esteem, and 6i) daily affect.

Hypothesis 6g. The model testing daily frequent exposure to positive or negative race-related media and the cortisol awakening response was not significant, $F(3, 44) = 1.72$, $p = .175$, $R^2 = .105$. Daily race-related media marginally predicted the cortisol

awakening response (path a), $t(44) = -1.782$, $p = .0817$, b = -.489, suggesting a main effect of frequency of exposure to positive or negative race-related media on the cortisol awakening response. The model testing cortisol awakening response predicting self-reported stress was not significant, $F(4, 43) = 1.102$, $p = .367$, $R^2 = .0930$. There was no significant relationship between the cortisol awakening response and daily stress (path b), $t(43) = -1.199$, $p = .239$, b = -.131. The total effect (path c) was not significant, $b = -.284$, $p = .162$, however, the direct effect (path c') was marginally significant, ($b = -.348$, $p = .0980$) suggesting a marginally significant effect of race-related media on daily stress when accounting for the mediation variable of the cortisol awakening response. The indirect effect (ab) was not significant, $b = .0641$, 95% CI [-.0484, .1904], therefore, Hypothesis 6h was not supported.

The model testing daily frequent exposure to positive or negative race-related media and the cortisol awakening response was not significant, $F(3, 44) = 1.728$, $p = .175$, $R^2 = .105$, however, race-related media did marginally predict the cortisol awakening response (path a), $t(44) = -1.781$, $p = .0817$, b = -.489, suggesting a main effect of exposure to positive or negative race-related media on the cortisol awakening response. The model testing the cortisol awakening response predicting daily state self-esteem was not significant, $F(4, 43) = .241$, $p = .913$, $R^2 = .0219$. The cortisol awakening response did not predict state self-esteem (path b), $t(43) = -.835$, $p = .408$, b = -.101. The total effect was not significant, $b = .0128$, $p = .954$, and the direct effect (path c') was also not significant ($b = -.0370$, $p = .872$). Finally, the indirect effect (ab) was not significant, $b = .0499$, 95% CI [-.0600, .1780], contrary to this part of Hypothesis 6h.

Hypothesis 6i. As previously stated, the model testing daily frequent exposure to positive or negative race-related media and the cortisol awakening response was not significant, $F(3, 44) = 1.728$, $p = .175$, $R^2 = .105$. however, race-related media did marginally predict the cortisol awakening response (path a), $t(44) = -1.781$, $p = .0817$, b = -.489, suggesting a main effect of exposure to positive or negative race-related media on the cortisol awakening response. The model testing the relationship between the cortisol awakening response and daily affect was not significant, $F(4, 43) = 1.261$, $p = .299$, $R^2 = .105$. The cortisol awakening response did not predict daily affect (path b), $t(44) = .217$, $p = .829$, b = .0217. The total effect (path c) was marginally significant, $b = .307$, $p = .0940$. The direct effect (path c') was also marginally significant ($b = .317$, $p = .0980$). These results suggest that there is a marginally significant effect of frequent exposure to positive or negative race-related media on daily affect when removing the mediation effect of the cortisol awakening response and there is a marginally significant effect of frequent exposure to positive or negative race-related media on daily affect when adding in the mediation variable of the cortisol awakening response. The indirect effect (ab) was not significant, $b = -.0106$, 95% CI [-.1083, .0982], therefore, Hypothesis 6i was not supported.

A final set of mediation analyses were used to test Hypotheses 6j, 6k, and 6l. These hypotheses stated the DHEA awakening responses would mediate the relationship between daily frequent exposure to positive or negative race-related media and 6j) daily self-reported stress, 6k) daily state self-esteem, and 6l) daily affect. Overall, the model testing exposure to race-related media predicting the DHEA awakening response was not significant, $F(3, 44) = 1.639$, $p = .193$, $R^2 = .101$ Daily exposure positive or negative

race-related media did not significantly predict the DHEA awakening response (path a), $t(44) = -1.595$, $p = .117$, b = -116.377.

For Hypothesis 6j, the model testing the DHEA awakening response and daily self-reported stress was not significant, $F(4, 43) = .801$, $p = .531$, $R^2 = .0694$. The DHEA awakening response did not predict daily stress (path b), $t(43) = -.558$, $p = .579$, b = -.0002. The total effect (path c) was also not significant, $b = -.284$, $p = .162$. The direct effect not significant, $b = -.311$, $p = .140$, and the indirect effect was not significant, $b = .0271$, 95% CI [-.0641, .1520], thus, Hypothesis 6j was not supported.

Hypothesis 6k predicted the DHEA awakening response would mediate the relationship between daily frequent exposure to positive or negative race-related media and state self-esteem. The model predicting a relationship between the DHEA awakening response and state self-esteem was not significant, $F(4, 43) = .0770$, $p = .988$, $R^2 = .0071$. The pathway from the DHEA awakening response and state self-esteem was not significant (path b), $t(43) = -.212$, $p = .832$, b = -.0001. The total effect was not significant, $b = .0128$, $p = .954$. The direct, ($b = .0014$, $p = .995$), and indirect, $b = .0115$, 95% CI [-.1010, .1275], effects were also not significant, therefore, Hypothesis 6k was not supported.

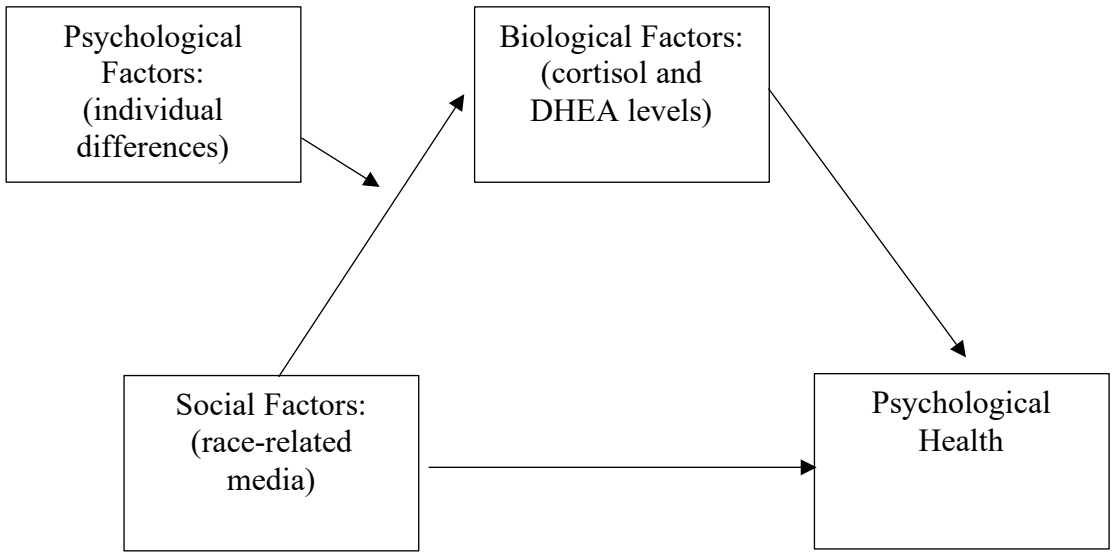
Finally, Hypothesis 6l, the model testing the DHEA awakening response predicting daily affect was not significant, $F(4, 43) = 1.33$, $p = .274$, $R^2 = .110$. The pathway from the DHEA awakening response to daily affect was not significant (path b), $t(43) = -.542$, $p = .591$, b = -.0002. Also, the total effect was not significant (path c), $b = .307$, $p = .0940$. The direct effect (path c') of was not significant, $b = .283$, $p = .134$, and

the indirect effect was not significant, b = .0236, 95% CI [-.0643, .1336]. Overall, these results show no support for Hypothesis 6l.

Hypothesis 7

For Hypothesis 7, the PROCESS macro (Hayes, 2012) was used to examine the moderation effects of individual differences (trait self-esteem, optimism, perceived control, ability to cope with discrimination, experiences with discrimination, race-identity, race-rejection sensitivity, and activism) on the pathway between frequent exposure to positive or negative race-related media and biological markers (baseline cortisol and DHEA, cortisol and DHEA slope, and cortisol and DHEA awakening responses) on psychological health (see Figure 11). Like Hypotheses 5 and 6, confidence intervals of moderated indirect effects were computed using 1,000 bootstrapped sampled for each analysis. Hypothesis 7 proposed a moderated mediation model, however, Hypothesis 5 and 6 suggested no significant mediation of frequent exposure to positive or negative race-related media and biological markers (e.g., baseline cortisol and DHEA, cortisol and DHEA slopes, and the cortisol and DHEA awakening responses) on psychological health, therefore, Hypothesis 7 cannot be supported. Since all moderation models were not significant, the results presented for Hypothesis 7 only include the index of moderated mediation.

Figure 11. Proposed Model for Moderated-Meditation Analyses Tested in Hypothesis 7.



Hypothesis 7a. The moderated-mediation models examining baseline trait self-esteem as a moderating variable between baseline frequent exposure to positive or negative race-related media and baseline cortisol were not significant in explaining baseline self-reported stress, interaction: b = -.0384, 95% CI [-.1490, .0281], or baseline affect, interaction: b = .0225, 95% CI [-.0521, .1469]. Similarly, analysis of baseline trait self-esteem as a moderating variable between baseline frequent exposure to positive or negative race-related media and baseline DHEA were not significant in explaining baseline self-reported stress, interaction: b = .0014, 95% CI [-.0653, .0312], or interaction: baseline affect, b = -.0064, 95% CI [-.0880, .0944]. Therefore, Hypothesis 7a regarding baseline cortisol and baseline DHEA were not supported.

The moderated-mediation models examining baseline trait self-esteem as a moderating variable between daily frequent exposure to positive or negative race-related media and daily cortisol slope were not significant in explaining daily self-reported

stress, interaction: *b* = -.0752, 95% CI [-.2745, .0441], interaction: state self-esteem, *b* = --.0513, 95% CI [-.2715, .0751], or daily affect, interaction: *b* = .0375, 95% CI [-.0612, .1946]. Trait self-esteem was also not significant in moderating the relationship between daily frequent exposure to positive or negative race-related media and daily DHEA slope on daily self-reported stress, interaction: *b* = -.115, 95% CI [-.3295, .0160], interaction: daily state self-esteem, *b* = -.162, 95% CI [-.4789, .0064], or daily affect, interaction: *b* = .0187, 95% CI [-.0800, .1531]. Hypothesis 7a, regarding daily cortisol and daily DHEA slope, were not supported.

Finally, for Hypothesis 7a, a moderated-mediation model was also used to test baseline trait self-esteem as a moderating variable between daily frequent exposure to positive or negative race-related media and the daily cortisol awakening response on daily psychological health. Trait self-esteem was not significant in moderating the relationship between daily frequent exposure to positive or negative race-related media and the cortisol awakening response on daily self-reported stress, interaction: *b* = .0713, 95% CI [-.0368, .2513], daily state self-esteem, interaction: *b* = .0412, 95% CI [-.0584, .2109], or daily affect, interaction: *b* = -.0211, 95% CI [-.1320, .0629]. Further, trait self-esteem was not significant in moderating the relationship between daily frequent exposure to positive or negative race-related media and the daily DHEA awakening response on daily self-reported stress, interaction: *b* = .0097, 95% CI [-.0599, .1029], daily state self-esteem, interaction: *b* = .0067, 95% CI [-.0806, .0743], or daily affect, interaction: *b* = .0038, 95% CI [-.0484, .0827]. Therefore, Hypothesis 7a was not supported.

For Hypothesis 7b, similar moderated-mediation models were used to examine baseline optimism as a moderating variable between baseline frequent exposure to positive or negative race-related media and baseline cortisol on baseline self-reported stress and baseline affect. Baseline frequent exposure to positive or negative race-related media and baseline cortisol were not significant in explaining baseline self-reported stress, interaction: b = -.0318, 95% CI [-.1781, .0619], or baseline affect, interaction: b = .0186, 95% CI [-.0680, .1655]. Similarly, baseline analysis of optimism as a moderating variable between baseline frequent exposure to positive or negative race-related media and baseline DHEA were not significant in explaining baseline self-reported stress, interaction: b = -.0049, 95% CI [-.0967, .0330], or baseline affect, interaction: b = .0217, 95% CI [-.0522, .1859]. Therefore, this part of Hypothesis 7b was not supported.

Next, for Hypothesis 7b, the moderated-mediation models examining baseline optimism as a moderating variable between daily frequent exposure to positive or negative race-related media and daily cortisol slope were also not significant in explaining daily self-reported stress, interaction: b = -.0997, 95% CI [-.3648, .0595], daily state self-esteem, interaction: b = -.0681, 95% CI [-.3263, .0948], or daily affect, interaction: b = .0498, 95% CI [-.0818, .2548]. Similarly, baseline optimism was not a significant moderator of the relationship between daily frequent exposure to positive or negative race-related media and daily DHEA slope on daily self-reported stress, interaction: b = -.198, 95% CI [-.4923, .0208], daily state self-esteem, interaction: b = -.277 95% CI [-.6954, .0113], or daily affect, interaction: b = .0319, 95% CI [-.1464, .2188], contrary to Hypothesis 7b.

Finally, for Hypothesis 7b, a moderated-mediation model was used to test baseline optimism as a moderating variable between daily frequent exposure to positive or negative race-related media and the daily cortisol awakening response. Optimism was not significant in moderating the relationship between daily frequent exposure to positive or negative race-related media and the daily cortisol awakening response on daily self-reported stress, interaction: b = .0732, 95% CI [-.0508, .2942], daily state self-esteem, interaction: b = .0422, 95% CI [-.0731, .2168], or daily affect, interaction: b = -.0216, 95% CI [-.1484, .0634]. Further, baseline optimism was not significant in moderating the relationship between daily frequent exposure to positive or negative race-related media and the DHEA awakening response on daily self-reported stress, interaction: b = .0138, 95% CI [-.0789, .1322], daily state self-esteem, interaction: b = .0095, 95% CI [-.0980, .0912], or daily affect, interaction: b = .0055, 95% CI [-.0656, .1087]. Therefore, Hypothesis 7b was not supported.

Hypothesis 7c. The moderated-mediation models examining baseline perceived control as a moderating variable between baseline frequent exposure to positive or negative race-related media and baseline cortisol were not significant in explaining baseline self-reported stress, interaction: b = -.0061, 95% CI [-.1190, .1508], or baseline affect, interaction: b = .0035, 95% CI [-.1269, .1231. Similarly, analysis of baseline perceived control as a moderating variable between baseline frequent exposure to positive or negative race-related media and baseline DHEA were not significant in explaining baseline self-reported stress, interaction: b = -.0174, 95% CI [-.1151, .1440], or baseline affect, interaction: b = -.0767, 95% CI [-.1101, .3204]. Therefore, Hypothesis 7c, regarding baseline cortisol and DHEA, was not supported.

Next, the moderated-mediation models examining baseline perceived control as a moderating variable between daily frequent exposure to positive or negative race-related media and daily cortisol slope were not significant in explaining daily self-reported stress, interaction: *b* = .137, 95% CI [-.1077, .4039], daily state self-esteem, interaction: *b* = .0938, 95% CI [-.1735, .3849], or daily affect, interaction: *b* = -.0686, 95% CI [-.2695, .1626]. Baseline perceived control was also not significant in moderating the relationship between frequent daily exposure to positive or negative race-related media and DHEA slope on daily self-reported stress, interaction: *b* = .0701, 95% CI [-.1434, .4080], daily state self-esteem, interaction: *b* = -.0981, 95% CI [-.1663, .6023], or daily affect, interaction: *b* = -.0113, 95% CI [-.1756, .0880], thus, this part of Hypothesis 7c was not supported.

Finally, for Hypothesis 7c, a moderated-mediation model was also used to test baseline perceived control as a moderating variable between frequent daily exposure to positive or negative race-related media and the daily cortisol awakening response on daily psychological health outcomes. Baseline perceived control was not significant in moderating the relationship between frequent daily exposure to positive or negative race-related media and the cortisol awakening response on daily self-reported stress, interaction: *b* = -.1021, 95% CI [-.3828, .1078], daily state self-esteem, interaction: *b* = -.0589, 95% CI [-.2246, .1472], or daily affect, interaction: *b* = .0301, 95% CI [-.1248, .1696]. Baseline perceived control was also not significant in moderating the relationship between daily exposure to positive or negative race-related media and the daily DHEA awakening response on daily self-reported stress, interaction: *b* = .0010, 95% CI [-.1192, .0957], daily state self-esteem, interaction: *b* = .0007, 95% CI [-.0873, .1322], or daily

affect, interaction: *b* = .0004, 95% CI [-.1120, .0858]. Therefore, Hypothesis 7c was not supported.

Hypothesis 7d. Moderated-mediation models were used to examine baseline ability to cope with discrimination as a moderating variable between baseline frequent exposure to positive or negative race-related media and baseline cortisol on self-reported baseline stress and baseline affect. Baseline frequent exposure to positive or negative race-related media and baseline cortisol were not significant in explaining baseline self-reported stress, interaction: *b* = .0192, 95% CI [-.0429, .0808], or baseline affect, interaction: *b* = -.0112, 95% CI [-.0879, .0525]. Similarly, analysis on baseline ability to cope with discrimination as a moderating variable between baseline frequent exposure to positive or negative race-related media and baseline DHEA were not significant in explaining baseline self-reported stress, interaction: *b* = -.0037, 95% CI [-.0484, .0310], or baseline affect, interaction: *b* = .0162, 95% CI [-.0266, .1036]. Therefore, this part of Hypothesis 7d was not supported.

Next, the moderated-mediation models examining baseline ability to cope with discrimination as a moderating variable between daily frequent exposure to positive or negative race-related media and daily cortisol slope were also not significant in explaining daily self-reported stress, interaction: *b* = .0057, 95% CI [-.0727, .0922], daily state self-esteem, interaction: *b* = .0039, 95% CI [-.0626, .0791], or daily affect, interaction: *b* = -.0028, 95% CI [-.0621, .0478]. Similarly, baseline ability to cope with discrimination was not significant in moderating the relationship between frequent daily exposure to positive or negative race-related media and DHEA slope on daily self-reported stress, interaction: *b* = -.0799, 95% CI [-.2303, .0292], daily state self-esteem,

interaction: *b* = -.112, 95% CI [-.2928, .0207], or daily affect, interaction: *b* = .0129, 95% CI [-.0784, .0820], contrary to Hypothesis 7d.

Lastly, for Hypothesis 7d, a moderated mediation model was used to test baseline ability to cope as a moderating variable between frequent daily exposure to positive or negative race-related media and the daily cortisol awakening response on various daily outcomes. Baseline ability to cope with discrimination was not significant in moderating the relationship between frequent daily exposure to positive or negative race-related media and the daily cortisol awakening response on daily self-reported stress, interaction: *b* = .0099, 95% CI [-.713, .1303], daily state self-esteem, interaction: *b* = .0057, 95% CI [-.0554, .0988], or daily affect, interaction: *b* = -.0029, 95% CI [-.0656, .0357]. Further, baseline ability to cope with discrimination was not significant in moderating the relationship between daily frequent exposure to positive or negative race-related media and the daily DHEA awakening response on daily self-reported stress, interaction: *b* = .0234, 95% CI [-.0460, .1037], daily state self-esteem, interaction: *b* = .0161, 95% CI [-.0761, .0900], or daily affect, interaction: *b* = .0348, 95% CI [-.0527, .0941], therefore, Hypothesis 7d was not supported.

Hypothesis 7e. The moderated-mediation models examining baseline experiences with discrimination as a moderating variable between baseline frequent exposure to positive or negative race-related media and baseline cortisol were not significant in explaining baseline self-reported stress, interaction: *b* = .0092, 95% CI [-.1109, .1785], or baseline affect, interaction: *b* = -.0054, 95% CI [-.1813, .1002]. Similarly, analysis examining baseline experiences with discrimination as a moderating variable between baseline frequent exposure to positive or negative race-related media and baseline DHEA

were also not significant in explaining baseline self-reported stress, interaction: *b* = .0004, 95% CI [-.0753, .1288], or baseline affect, interaction: *b* = .-.0016, 95% CI [-.2750, .1492]. Therefore, Hypothesis 7e, regarding baseline cortisol and DHEA, was not supported.

Next, the moderated-mediation models with baseline experiences with discrimination as a moderating variable between frequent daily exposure to positive or negative race-related media and daily cortisol slope were not significant in explaining daily self-reported stress, interaction: *b* = .0143, 95% CI [-.1153, .2055], daily state self-esteem, interaction: *b* = .0098, 95% CI [-.1067, .1829], or daily affect, interaction: *b* = -.0071, 95% CI [-.1486, .0672]. Baseline experiences with discrimination was also not significant in moderating the relationship between frequent daily exposure to positive or negative race-related media and daily DHEA slope on daily self-reported stress, interaction: *b* = -.0890, 95% CI [-.3426, .0752], daily state self-esteem, interaction: *b* = -.125, 95% CI [-.4658, .0883], or daily affect, interaction: *b* = .0143, 95% CI [-.1113, .1187]. Thus, this part of Hypothesis 7e was not supported.

Finally, for Hypothesis 7e, a moderated-mediation model was also used to test baseline experiences with discrimination as a moderating variable between frequent daily exposure to positive or negative race-related media and the cortisol awakening response on self-reported daily outcomes. Baseline ability to cope with discrimination was not significant in moderating the relationship between frequent daily exposure to positive or negative race-related media and the daily cortisol awakening response on daily self-reported stress, interaction: *b* = -.0505, 95% CI [-.2643, .0850], daily state self-esteem, interaction: *b* = -.0291, 95% CI [-.2229, .0605], or daily affect, interaction: *b* = .0149,

95% CI [-.0811, .1047]. Further, baseline ability to cope with discrimination was not significant in moderating the relationship between frequent daily exposure to positive or negative race-related media and the daily DHEA awakening response on daily self-reported stress, interaction: *b* = .0165, 95% CI [-.0810, .1297], daily state self-esteem, interaction: *b* = -.0113, 95% CI [-.0823, .1264], or daily affect, interaction: *b* = .0066, 95% CI [-.0833, .1034]. Therefore, results show that Hypothesis 7e was not supported.

Hypothesis 7f, moderated-mediation models were used to examine baseline racial identity as a moderating variable between baseline exposure to positive or negative race-related media and baseline cortisol on baseline self-reported stress and baseline affect. Baseline frequent exposure to positive or negative race-related media and baseline cortisol were not significant in explaining baseline self-reported stress, interaction: *b* = -.0589, 95% CI [-.2923, .0422], or baseline affect, interaction: *b* = .0344, 95% CI [-.0699, .2873]. Similarly, analysis on baseline racial identity as a moderating variable between baseline frequent exposure to positive or negative race-related media and baseline DHEA were not significant in explaining baseline self-reported stress, interaction: *b* = -.0228, 95% CI [-.2247, .1109], or baseline affect, interaction: *b* = .100, 95% CI [-.0829, .4109]. Therefore, this part of Hypothesis 7f was not supported.

The moderated-mediation models examining baseline racial identity as a moderating variable between frequent daily exposure to positive or negative race-related media and daily cortisol slope were also not significant in explaining daily self-reported stress, interaction: *b* = .0373, 95% CI [-.1471, .2482], daily state self-esteem, interaction: *b* = .0255, 95% CI [-.1314, .2406], or daily affect, interaction: *b* = -.0186, 95% CI [-.1554, .1218]. Similarly, baseline racial identity was not significant in moderating the

relationship between frequent daily exposure to positive or negative race-related media and DHEA slope on daily self-reported stress, interaction: *b* = -.138, 95% CI [-.4771, .1038], daily state self-esteem, interaction: *b* = -.192, 95% CI [-.6198, .1511], or daily affect, interaction: *b* = .0822, 95% CI [-1571, .1890], contrary to Hypothesis 7f.

Finally, for hypothesis 7f, a moderated-mediation model was used to test baseline racial identity as a moderating variable between frequent daily exposure to positive or negative race-related media and the daily cortisol awakening response on daily psychological outcomes. Baseline racial Identity was not significant in moderating the relationship between frequent daily exposure to positive or negative race-related media and the cortisol awakening response on daily self-reported stress, interaction: *b* = .0879, 95% CI [-.1370, .4045], daily state self-esteem, interaction: *b* = .0507, 95% CI [-.0702, .3516], or daily affect, interaction: *b* = -.0259, 95% CI [-.2022, .0846]. Further, baseline racial identity was not significant in moderating the relationship between frequent daily exposure to positive or negative race-related media and the daily DHEA awakening response on daily self-reported stress, interaction: *b* = .0244, 95% CI [-.1191, .1817], daily state self-esteem, interaction: *b* = .0168, 95% CI [-.1277, 1775], or daily affect, interaction: *b* = .0097, 95% CI [-.1123, .1603], thus Hypothesis 7f was not supported.

Finally, the last part of Hypothesis 7 (Hypothesis 7g) yield no significant effects. The moderated-mediation models examining baseline activism as a moderating variable between baseline frequent exposure to positive or negative race-related media and baseline cortisol were not significant in explaining baseline self-reported stress, interaction: *b* = .0050, 95% CI [-.0633, .0730], or baseline affect, interaction: *b* = -.0029, 95% CI [-.0864, .0408]. Similarly, analysis examining baseline activism as a moderating

variable between frequent baseline exposure to positive or negative race-related media and baseline DHEA were not significant in explaining baseline self-reported stress, interaction: *b* = -.0019, 95% CI [-.0364, .0450], or baseline affect, interaction: *b* = .0082, 95% CI [-.0781, .0701]. Therefore, Hypothesis 7g, regarding baseline cortisol and DHEA, was not supported.

Next, the moderated-mediation models examining baseline activism as a moderating variable between frequent daily exposure to positive or negative race-related media and daily cortisol slope were not significant in explaining daily self-reported stress, interaction: *b* = -.0442, 95% CI [-.2420, .0449], daily state self-esteem, interaction: *b* = -.0302, 95% CI [-.2184, .0602], or daily affect, interaction: *b* = .0221, 95% CI [-.0629, .1511]. Baseline activism was also not significant in moderating the relationship between frequent daily exposure to positive or negative race-related media and daily DHEA slope on daily self-reported stress, interaction: *b* = -.103, 95% CI [-.3214, .0338], daily state self-esteem, interaction: *b* = -.144, 95% CI [-.4572, .0316], or daily affect, interaction: *b* = .0166, 95% CI [-.1060, .1289]. Thus, this part of Hypothesis 7g was not supported.

Finally, for Hypothesis 7g, a moderated-mediation model was also used to test baseline activism as a moderating variable between frequent daily exposure to positive or negative race-related media and the daily cortisol awakening response on stated daily outcomes. Baseline activism was not significant in moderating the relationship between frequent daily exposure to positive or negative race-related media and the daily cortisol awakening response on daily self-reported stress, interaction: *b* = .0770, 95% CI [-.0339, .2347], daily state self-esteem, interaction: *b* = .0444, 95% CI [-.0491, .1797], or daily

affect, interaction: *b* = -.0227, 95% CI [-.1044, .0546]. Further, baseline activism was not significant in moderating the relationship between frequent daily exposure to positive or negative race-related media and the daily DHEA awakening response on daily self-reported stress, interaction: *b* = .0312, 95% CI [-.0623, .1483], daily state self-esteem, interaction: *b* = .0215, 95% CI [-.0835, .1400], or daily affect, interaction: *b* = .0124, 95% CI [-.0626, .1325]. Therefore, Hypothesis 7g was not supported.

Discussion

This study examined the multiple pathways of a biopsychosocial model of racial health disparities and investigated the relationships among exposure to positive or negative race-related media, individual differences, and physiological (e.g., cortisol and DHEA) and psychological health outcomes (e.g., self-reported stress, state self-esteem, and positive affect). This study uniquely examined how negative race-related media exposure can contribute to allostatic load in young Black Americans. Although many hypotheses were not supported (see Appendix F), results have implications in multiple areas of research including racial health disparities, the role of media in young adulthood, and interventions to reduce the impact of racism.

Prior research indicates that DHEA significantly correlates with cortisol increasing during stressful situations (Dickerson & Kemeny, 2004); however, race-based stress, specifically shows the opposite effect by producing decreased DHEA levels and increased cortisol levels (Mendes et al., 2007). Contrary to previous research suggesting that race-related stress creates dysregulation of cortisol and DHEA release, results suggest otherwise. Results indicated that baseline levels of cortisol and DHEA were significantly correlated among participants with frequent exposure to negative race-

related media, but not among participants with frequent exposure to positive race-related media. These results suggest that while racial stress is not associated with cortisol dysregulation and DHEA release, it is related to a correlation (regulation) of cortisol and DHEA which is congruent with other research showing that stress produces a correlation between the two hormones (Dickerson & Kemeny, 2004).

Results from this study also indicated that cortisol slope and DHEA slope were significantly correlated and the cortisol awakening response and the DHEA awakening response were significantly correlated in both participants reporting frequent exposure to negative race-related media and in participants reporting frequent exposure to positive race-related media. This suggests that race-related stress does not correlate with the dysregulation of cortisol and DHEA's slope or morning awakening responses, meaning that cortisol and DHEA are diurnally regulated in both participants reporting frequent exposure to negative race-related media and in participants reporting frequent exposure to positive race-related media. Overall, race-related stress showed synchrony of cortisol and DHEA at baseline and diurnally similar to the stress response seen from other types of stressors (e.g., public speaking, work stress, etc.).

While research has established the impact of race-related stressors on the activation of the biological stress response system **(**Berger & Sarnyai, 2015; Williams & Mohammed, 2009**),** this study reported the effects of media as a source of race-related stress on cortisol and DHEA. Results show that exposure to positive or negative race-related media did predict HPA axis activity, but not as hypothesized. Baseline levels of cortisol and DHEA were significantly higher in participants reporting frequent exposure to positive race-related media than participants reporting frequent exposure to negative

race-related media. These results suggest that frequent positive exposure to race-related media is correlated with a higher baseline stress response than frequent exposure to negative race-related media. Although inconsistent with previous research that states baseline levels of cortisol are higher among Black Americans with higher reported experiences of discrimination (Huynh, Guan, Almeida, McCreath, & Fuligni, 2016), these findings suggests that greater ingroup pride is related to greater baseline levels of DHEA (Ratner, Halim, & Amodio, 2013). More positive exposure to race-related factors correlates with baseline DHEA, as demonstrated by both this study and previous research.

Although differences were found for cortisol and DHEA at baseline, results indicated no difference between frequent exposure to positive race-related media and frequent exposure to negative race-related media in diurnal measurements. This study found that exposure to positive or negative race-related media did not predict differences in cortisol and DHEA slope or the cortisol and DHEA awakening responses. These findings are inconsistent with research suggesting greater everyday race-related stressors correlate with flatter diurnal cortisol and DHEA slope, and a blunted cortisol awakening response (Lee et al., 2018; Skinner et al., 2011) Further, prior research suggests that greater everyday perceived discrimination is linked to decreases in the cortisol awakening response and flatter diurnal cortisol slope (Huyhn et al., 2016). However, the results from this study suggest that daily exposure to positive or negative race-related media does not have a relationship with the diurnal HPA axis in the same way as similar race-related stressors (e.g., perceived discrimination).

Another goal was to investigate individual differences that may weaken or exacerbate the relationship between race-related stress (e.g., exposure to positive or negative race-related media) and health outcomes (e.g., cortisol, DHEA, self-reported stress, state self-esteem, and positive affect). Individual differences have been shown to moderate the effects of racism on racial minorities (Lee et al., 2018). This study found that trait optimism may be a protective factor against daily race-related stress from media. Results from this study suggest that among women with lower optimism, daily exposure to negative race-related media predicted a flatter DHEA diurnal slope compared to women with higher optimism. Women with higher optimism had a steeper DHEA diurnal slope. The diurnal slope is an indicator of HPA axis functionality where flatter slopes indicate more adrenal fatigue (Adam et al., 2015; Williams, Lawrence, Davis, & Vu, 2019). These results are consistent with prior research. Previous studies suggest that optimistic people are less likely to get sick and more likely to live past the age of 85 (Lee et al., 2019). Further, Black Americans higher in optimism report less anxiety after experiencing a race related stressor (Lee, Neblett, & Jackson, 2015), where Black Americans lower in optimism report greater emotional vulnerability after a race-related stressor (Kaiser, Major, & McCoy, 2004). The results from this study suggested that women with higher optimism have a steeper, more adaptive diurnal slope compared to women lower in optimism. Consistent with previous research, optimism may be a resiliency factor that protects Black Americans from the harm of experiencing racism.

The results indicated that optimism may be an individual difference that protects against negative racial health disparities; further results indicated that lower perceived control may be a risk factor. Results showed that among women with lower perceived

control, frequent exposure to daily negative race-related media predicted a blunted cortisol awakening response compared to women with frequent exposure to positive race-related media. The cortisol awakening response is another measurement of adrenal functioning where blunted cortisol responses are an indication of maladaptive adrenal fatigue and can have serious health consequences (Adam et al., 2015; Zeider, Doane, & Roosa, 2012). Consistent with prior research on perceived control, results indicated that women with lower perceived control exhibit adrenal fatigue in response to frequent exposure to negative race-related media compared to women reporting frequent exposure to daily positive race-related media. These results suggest that having lower perceived control may be a risk factor for developing maladaptive allostatic load in response to a daily race-related stressor and in turn, may be a risk factor for stress-related racial health disparities.

Consistent with prior research on the benefits of racial identity (Lee, Lee, Hu, & Kim, 2015), results from this study show that among women with higher racial identity, greater exposure to positive race-related media correlated with higher levels of baseline DHEA. These results suggest that women with higher racial identity may be exhibiting higher levels of DHEA in response to positive race-related media compared to those reporting frequent exposure to negative race-related media. These results and prior literature suggest racial identity may be increasing DHEA as a protective mechanism. Additionally, these results support the previously discussed research that women higher in ingroup pride have higher levels of baseline DHEA (Ratner et al., 2013). The results build on this work (Ratner et al., 2013) and show that racial identity is correlated with higher DHEA in response to frequent exposure to positive race-related media.

As stated, previous research suggests that there may be individual differences that protect against race-related stress (Banks, Kohn-Wood, & Spender, 2006; Czopp & Monteith, 2003; Page-Gould, Mendoza-Denton, & Tropp, 2008). However, inconsistent with prior research, results showed no significant moderating or moderating mediation effects of trait self-esteem, ability to cope with discrimination, past experiences with discrimination, race-rejection sensitivity, or activism orientation. The effects of these individual differences were not present in this study.

Research has established that race-related stressors play a role in racial health disparities by impacting not only biological systems, but also psychological systems (Bennett, Merritt, Edwards, & Sollers, 2004; Brown et al., 2000; Busse et al., 2017). Greater experiences with racism are correlated with symptoms of depression (Lee et al., 2018) and increased psychological distress (Britt-Spells, Slebodnick, Sand, & Rollock, 2016). Studies have found that daily perceived discrimination increases feelings of general overall life stress (Pieterse, Carter, & Ray, 2013), and decreases self-esteem (Jones, Cross, & Defour, 2007; Stock, Peterson, Molloy, & Lambert, 2017). Inconsistent with previous research showing that race-related stress predicts various psychological outcomes, this study found that daily exposure to negative race-related media did not correlate with state self-esteem, however, there was a trending effect of frequent exposure to negative race-related media increasing daily self-reported stress and decreasing daily positive affect. Overall, the data suggest that daily exposure to frequent negative race-related media has a relationship with psychological self-report outcomes in a similar way that daily perceived discrimination does.

Lastly, this study examines the mechanistic model for psychological outcomes through the indirect effect of frequent exposure to positive or negative race-related media assessed by biological stress markers. These models were derived from previous research suggesting that race-related stress activates the stress response (Williams & Mohammed, 2009) and further research suggesting that increases in cortisol and DHEA levels impact psychological outcomes (Bennett et al., 2004).

Consistent with predictions, frequent exposure to race-related media did predict differences in cortisol levels, and cortisol levels did predict differences in self-reported stress. However, exposure to positive or negative race-related media did not predict differences in self-reported stress. These results are inconsistent with the hypothesized model. This suggests that exposure to race-related media may not predict self-reported stress directly, but that there may be an indirect path through cortisol levels. Inconsistent with predictions, no other mechanistic models were significant. Baseline cortisol and DHEA, cortisol and DHEA slope, and the cortisol and DHEA awakening responses did not mediate the relationship between exposure to positive or negative race-related media and psychological outcomes (e.g., self-reported stress, state self-esteem, and affect). Further, the results did not support the moderating effects of individual differences in this mediation model.

Through the biopsychosocial model of racial health disparities, chronic activation of the stress response system is thought to play a key role in the known health differences (Berger & Sarnyai, 2015). Results from this study show that the exposure to positive or negative race-related media does predict baseline levels of cortisol and DHEA, but not in a similar manner with prior research. Additionally, like prior research, results indicate

that optimism, perceived control, and racial identity, may act as protective factors against the activation of the stress system in response to daily exposure to negative race-related media.

Limitations

Although the results provide contributions to the literature on the biopsychosocial model of racial health disparities, there are several limitations. First, the design of the study is correlational; therefore, cause and effect cannot be determined. Participants were asked to take samples three times a day and diurnal cortisol and DHEA levels were correlated with their self-reported daily exposure to race-related media. The study does not manipulate how much race-related media the participants saw and solely relied on self-reported experiences. Self-reported frequent exposure to positive or negative race-related media is not a controlled way to test how much media participants were exposed to during the day; therefore, the results cannot state any causal relationships.

This study correlated frequent exposure to positive or negative race-related media and physiological and psychological outcomes; however, actual perceived racism from the media was not measured in all participants (see Appendix G). This is a limitation because previous research shows perceived racism impacts health outcomes, not frequency of exposure to race-related media of unknown content. Future research should go beyond frequency of exposure to race-related media and valence to investigate perceived racism from media.

Another limitation is the small sample size. Similar studies (Adam et al., 2015) included over 100 participants for diurnal cortisol analyses, whereas this study only had 48. Due to the small sample size, hierarchical linear modeling to account for the nested

nature of the data was not possible and less powerful statistical analyses were used (e.g., difference scores). Hierarchical linear modeling would have allowed consideration of day-to-day changes of diurnal cortisol and DHEA instead of relying on an average three-day score. Further, it was difficult to test low media exposure and very frequent positive race-related media exposure because this was uncommon among the sample, thus there was not a clear comparison group. This study created a dichotomous independent variable of exposure to frequent negative exposure and to frequent positive exposure to race-related media where using a continuous measure would have provided more statistical power.

Finally, there was not equal group distribution (e.g., frequent exposure to negative race-related media and frequent exposure to positive race-related media). Many of the participants reported seeing negative race-related media, where few participants reported seeing positive race-related media. This created an unequal distribution of the predictor variable which suggests that results cannot be generalized to all people seeing race-related media. Despite these limitations, the present study provides insight into research on the biopsychosocial model of racial health disparities and may inform interventions to combat the negative effects of racism on Black Americans.

Implications

This research provided partial support for the biopsychosocial model of racial health disparities by suggesting that negative race-related media has a relationship with the stress response system and individual differences may protect or exacerbate these effects. The present study demonstrates that baseline and diurnal cortisol and DHEA levels are correlated with frequent exposure to positive or negative race-related media.

Results from this study further the knowledge of adrenal fatigue in young Black women as a result of daily race-related social stress by measuring diurnal cortisol and DHEA patterns. These results show that viewing race-related media is a source of stress for Black Americans and may be contributing to the known racial health disparities. Results demonstrate that optimism, perceived control, and racial identity all play a protective role by changing diurnal biological rhythms. These findings may inform interventions to reduce racial health disparities. Further, previous research suggests that the relationship between racism and health outcomes can start in young adulthood; however, many studies look at the lifetime impact of racism in order adults. This study adds a unique contribution to the racial health disparities research by investigating racial stress on young adults 18-30 years of age. Further research should study the impact of racial stress on not only older adults and young adults but also children and teenagers.

Future research should also continue to investigate the impact of media as a source of racial stress among young Black Americans. As the prevalence and accessibility of media continue to increase in young adults' lives, it is important to understand the health impact this may have. Additionally, further research should investigate the acute impact of race-related media exposure on hormonal reactivity and the impact of actual perceived racism from media on diurnal hormone rhythms and reactivity. Research should also continue to investigate the psychological individual difference that may be resiliency factors for young Black Americans against racial health disparities. Lastly, future research should investigate interventions to promote increases in positive media exposure of Black Americans.

The results help to further understand and untangle the complex and not well-understood pathways from racism to disease. It was found that there may be psychological factors (e.g., individual differences) that add resiliency against race-related stress outcomes and these results help to inform future researchers and interventions. This research furthers the literature on racial health disparities by contributing to the biopsychosocial model and suggests that the social factor of media may be a source of racial health disparities.

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Appendix A
Internal Review Board Approval

Office of Research Administration

One University Boulevard
St. Louis, Missouri 63121-4499
Telephone: 314-516-5899
Fax: 314-516-6759
E-mail: ora@umsl.edu

DATE:	February 23, 2017
TO:	Mindy Siebert, BA
FROM:	University of Missouri-St. Louis IRB
PROJECT TITLE:	[1006338-2] Social Media Use and Stress Among Young Adults
REFERENCE #:	
SUBMISSION TYPE:	Revision
ACTION:	APPROVED
APPROVAL DATE:	February 23, 2017
EXPIRATION DATE:	February 23, 2018
REVIEW TYPE:	Full Committee Review

This proposal was approved by the University of Missouri-St. Louis IRB for a period of one year starting from the date listed above. The University of Missouri-St. Louis IRB must be notified in writing prior to major changes in the approved protocol. Examples of major changes are the addition of research sites or research instruments.

An annual report must be filed with the committee. This report should indicate the starting date of the project and the number of subjects since the start of project, or since last annual report.

Any consent or assent forms must be signed in duplicate and a copy provided to the subject. The principal investigator is required to retain the other copy of the signed consent form for at least three years following the completion of the research activity and the forms must be available for inspection if there is an official review of the UM-St. Louis human subjects research proceedings by the U.S. Department of Health and Human Services Office for Protection from Research Risks.

This action is officially recorded in the minutes of the committee.

If you have any questions, please contact Carl Bassi at 314-516-6029 or bassi@umsl.edu. Please include your project title and reference number in all correspondence with this committee.

Appendix B
Informed Consent

Department of Psychological Sciences
8001 Natural Bridge Road
336 Stadler Hall
St. Louis, Missouri 63131-4499
Telephone: 314-516-5386
Fax: 314-516-5393
Mmsqm9@mail.umsl.edu

Informed Consent for Participation in Research Activities

Social Media Study: Part 1

Participant_____ HSC Approval Number: 1006338-13

Principal Investigator Melinda Siebert PI's Phone Number: 314-516-5386
Co-Principal Investigator Dr. Bettina Casad Co-PI's Phone Number: 314-516-4504

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1. You are invited to participate in a research study conducted by Melinda Siebert and Dr. Bettina Casad from the Department of Psychological Sciences at the University of Missouri-St. Louis. You are being invited because you are a student at UMSL or a local university and responded to our advertisement. The purpose of this research is to examine students' use of and exposure to positive and negative social media as it relates to personality, life experiences, interpersonal relationships, and psychological well-being.

2. Your participation will involve completing an online questionnaire that includes questions on social network site usage, personality (e.g., identity, optimism, perceived control, coping styles), life experiences (e.g., experiences with race discrimination), interpersonal relationships, and psychological well-being (e.g., self-esteem, mood).

   a. Approximately 150 participants may be involved in this research at the University of Missouri-St. Louis.

   b. The amount of time involved in your participation will be 45-60 minutes and you will be compensated with $10 in the form of a personal check or 1 Sona credit.

3. **Precautions**: If you have depression, anxiety, or Post-Traumatic Stress Disorder (PTSD) or experience depression, anxiety, or PTSD symptoms (e.g., feelings of

hopelessness, loss of interest, restlessness, nightmares, flashbacks), we do not recommend that you participate in this study. Some of the questions asked in this part of the study may be upsetting, for example questions on experiences with racial discrimination. Additionally, if you experienced any trauma or severe stress from the events surrounding the shooting of Michael Brown in Ferguson, MO or the related riots, we do not recommend that you participate in this study. Some of the questions ask about your knowledge of the Black Lives Matter movement.

4. The risk of participation is moderate. The risks include feeling stressed due to answering questions about possible uncomfortable situations and personal feelings. You may become emotionally upset by the content of some questions.

5. There are no direct benefits for participating in this part of the study

6. There are three parts to this study. The first part is an online questionnaire that takes 45-60 minutes. You will be compensated with $10 for completing this part of the study. The second part of the study is optional and is an in-lab portion that takes 30 minutes. In this part of the study you will be compensated with $10. The third part is also optional and will require you to take saliva samples at home and answer one questionnaire a night for three days. For this part of the study you will be compensated with up to $60 ($5 per sample and $5 per survey)

7. You will be assigned a unique ID number that is connected to your data in order to pair the online questionnaire data to the optional in-lab session data. That is, at the end of the study (2 years) your ID number will no longer be connected to your name. Your data will be kept secure on a password protected computer.

8. Your participation is voluntary and you may choose not to participate in this research study or withdraw you consent at any time. If you choose to withdraw at the beginning of the study you will not be compensated with payment. You need to complete at least 90% (248 out of 275) of the questions and answer the three quality check questions correctly to receive compensation. This will allow you to skip some questions if you feel too uncomfortable answering them.

9. We will do everything we can to protect your privacy. As part of this effort, your identity will not be revealed in any publication that may result from this study. In rare instances, a researcher's study must undergo an audit or program evaluation by an oversight agency (such as the Office of Human Research Protection) that would lead to disclosure of your data as well as any other information collected by the researcher.

10. If you have any questions or concerns regarding this study, or if any problem arises, you may call or email the Investigators, Melinda Siebert at 314-516-5386 (mmsqm9@mail.umsl.edu) or Dr. Bettina Casad at 314-516-4504 (casadbj@umsl.edu). You may also ask questions or state concerns regarding your rights as a research participate to the Office of Research at 314-516-5899.

I have read this consent form and have been given the opportunity to ask questions via phone or email. It is recommended that you print a copy of this form for your records. I hereby consent to my participation in the research described above.

By continuing with and completing this online survey, you are giving consent to use your information under the condition of confidentiality.

Would you like to participate in the survey?

___ Yes, please direct me to the survey

___ No, I would like to exit the survey

UMSL

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Informed Consent for Participation in Research Activities

Social Media Study: Part 2

Participant_____ HSC Approval Number: 1006338-13

Principal Investigator Melinda Siebert PI's Phone Number: 314-516-5386
Co-Principal Investigator Dr. Bettina Casad Co-PI's Phone Number: 314-516-4504

---

1. You are invited to participate in a research study conducted by Melinda Siebert and Dr. Bettina Casad from the Department of Psychological Sciences at the University of Missouri-St. Louis. You are being invited because you are a student at UMSL or a local university and responded to our advertisement and you have completed part 1 of the Social Media study. The purpose of this research is to examine students' use of and exposure to positive and negative social media as it relates to personality, interpersonal relationships, psychological well-being, and academic performance.

2. Your participation will involve

    a. Completing a brief health questionnaire to determine your eligibility for the study at this time.
    b. Watching a 10-minute nature video.
    c. Allowing the researcher to collect a saliva sample.
    d. Completing a 10-minute academic assessment.

e. Having your questions answered and learning more about the purpose of this study.

3. The researcher will instruct you on the method of saliva collection. The collection pieces used for the saliva samples are new and are discarded after each use.

4. Approximately 150 participants may be involved in this research at the University of Missouri-St. Louis.

5. The amount of time involved in your participation in this phase of the study will be 30 minutes and you will be compensated with $10.

6. The risk of participation is minimal. The risks include feeling potential embarrassment when answering questions about your health and providing a saliva sample. This stress will be similar to experiences of being evaluated and taking academic assessments.

7. You may benefit from participating in this study by becoming aware, or more aware, of the relationship between social media use and daily stress. This greater awareness, which will be facilitated by the study information we provide, may prompt you to make changes in how and/or how often you use social media and pay more attention to the content of social media (positive or negative).

8. You will be assigned a unique ID number that is connected to your data in order to pair the online questionnaire data from Part 1 to the in-lab session data. That is, at the end of the study (2 years) your ID number will no longer be connected to your name. Your data will be kept secure on a password protected computer.

9. Saliva collected via the passive drool method are stored in a cryovial that is labeled with your unique participant ID number only. The purpose of collecting saliva samples is to analyze your resting state, or baseline, stress and immune system activity. Samples are immediately stored in a -20 degree freezer and are sent to Salimetrics within 4 months to be processed. No personally identifying information is shared with Salimetrics besides the ID number on each cryovial.

10. Your participation is voluntary and you may choose not to participate in this research study or withdraw your consent at any time. If after providing consent you decide not to continue or end your participation early, you will be compensated with .5 Sona credits OR $10. If you decide not to consent to participate, alternatives for course extra credit are provided on the Sona System.

11. There is optional follow-up phase, Part 3, of this study in which you take saliva samples at home and complete an online survey each day over a three-day period. If you choose to participate in the optional follow-up Part 3 phase, you will be compensated with up to $60 ($5 per saliva sample, and $5 per survey). The researcher will provide you with more information at the end of this study today.

12. We will do everything we can to protect your privacy. As part of this effort, your identity will not be revealed in any publication that may result from this study. In rare instances, a researcher's study must undergo an audit or program evaluation by an oversight agency (such as the Office of Human Research Protection) that would lead to disclosure of your data as well as any other information collected by the researcher.

13. If you have any questions or concerns regarding this study, or if any problem arises, you may call or email the Investigators, Melinda Siebert at 314-516-5386 (mmsqm9@mail.umsl.edu) or Dr. Bettina Casad at 314-516-4504 (casadbj@umsl.edu). You may also ask questions or state concerns regarding your rights as a research participate to the Office of Research at 314-516-5899.

I have read this consent form and have been given the opportunity to ask questions. I will also be given a copy of this consent form for my records. I hereby consent to my participation in the research described above.

Participant's Signature_____
Date_____

Signature of Investigator or Designee_____

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Informed Consent for Participation in Research Activities

Social Media Study: Part 3

Participant_____ HSC Approval Number_____1006338-13

Principal Investigator Melinda Siebert PI's Phone Number: 314-516-5386
Co-Principal Investigator Dr. Bettina Casad Co-PI's Phone Number: 314-516-4504

14. You are invited to participate in a research study conducted by Melinda Siebert and Dr. Bettina Casad from the Department of Psychological Sciences at the University of Missouri-St. Louis. You are being invited because you are a student at UMSL or a local university and you completed our Social Media Study Parts 1 and 2. The purpose of this research is to examine students' use of and exposure to positive and negative social media as it relates to personality, experiences of race discrimination, psychological well-being, interpersonal relationships, and academic performance.

    15. Your participation will involve

        f. Using our supplies to collect a sample of your saliva three times a day (when waking, 30 minutes after waking, and at bed time) for three consecutive days.
        g. Placing the collected saliva samples in a freezer immediately after collection.
        h. Completing a 15-minute online questionnaire each night before going to bed.
        i. Accepting our "friend request" on Facebook from our lab account "Social Neuroscience Lab" and/or allowing the researcher to follow you on Twitter and/or Instagram (if you have these accounts). The purpose is to access your social media activity during the duration of the study only (3 days). The researcher will take screenshots of what is posted and shared on your social media sites; however, all identifying names and identifying pictures will be blacked to protect your identity. The screenshots will be labeled with your unique ID number so that all your information is confidential and cannot be identified by anyone outside our research team. You have the right to decline the researcher access to your social media accounts and still participate in this study and receive the same rate of compensation.
        j. Allowing a researcher to pick up your saliva samples from your home.
        k. At the end of the three-day study: Having your questions answered and learning more about the purpose of this study.

    16. Approximately 100 participants may be involved in this research at the University of Missouri-St. Louis.

    17. The amount of time involved in your participation in this phase of the study will be approximately 30 minutes a day for three days, totaling 90 minutes. It is estimated that taking the saliva sample takes 5 minutes (15 minutes daily) and the online questionnaire takes 15 minutes. You will be compensated with up to $60 ($5 for each sample: 3/day, x3 days or $45) and $5 for each survey (x3, or $15). *Compensation is prorated if incomplete. Payment is provided at the rate of $5 per saliva sample and $5 per completed survey.

    18. You will be assigned a unique ID number that is connected to your data in order to pair the online questionnaire data with the in-lab session data and the data you provide at home. However, at the end of the study (2 years) your ID number will no longer be connected to your name. Your data will be kept secure on a password protected computer.

19. During the 3-day period, if the researchers view comments indicating that you are considering harming yourself or others, we will email you a list of referrals for resources including a suicide hotline and local counseling services. The screenshots will be kept up to 1 year of the conclusion of the study or June 2019. After coding of the pages is complete, the screenshots will be deleted.

20. Saliva collected via the passive drool method are stored in a cryovial that is labeled with your unique participant ID number only. The purpose of collecting saliva samples is to analyze your resting state, or baseline, and stress and immune system activity throughout the day. Samples must be immediately stored in a freezer and will be sent to Salimetrics within 4 months to be processed. No personally identifying information is shared with Salimetrics besides the ID number on each cryovial.

21. The risks of participation include mild to moderate stress from completing questionnaires that ask about your daily experiences with social media use and exposure to positive and negative social media. You may experience discomfort from taking three saliva samples each day.

22. You may benefit from participating in this study by becoming aware, or more aware, of the relationship between social media use and daily stress. By merely participating in the study and answering questions about and reporting daily social media use, you my become more aware of how you are personally affected by social media use and exposure. This greater awareness, which will be facilitated by the study information we provide, may prompt you to make changes in how and/or how often you use social media and pay more attention to social media content (positive or negative).

23. Your participation is voluntary and you may choose to not participate in this research study or withdraw your consent at any time. You will NOT be penalized in any way should you choose not to participate or withdraw from the study. If after providing consent and starting the study you decide to discontinue, you will be compensated with a prorated amount of $5 per sample and $5 per survey completed. You need to complete at least 90% (54 out of 60) of the questions to receive compensation. This will allow you to skip some questions if you feel too uncomfortable answering them.

24. We will do everything we can to protect your privacy. As part of this effort, your identity will not be revealed in any publication that may result from this study. In rare instances, a researcher's study must undergo an audit or program evaluation by an oversight agency (such as the Office of Human Research Protection) that would lead to disclosure of your data as well as any other information collected by the researcher.

25. If you have any questions or concerns regarding this study, or if any problem arises, you may call or email the Investigators, Melinda Siebert at 314-516-5386 (mmsqm9@mail.umsl.edu) or Dr. Bettina Casad at 314-516-4504 (casadbj@umsl.edu). You may also ask questions or state concerns regarding your rights as a research participate to the Office of Research at 314-516-5899.

I have read this consent form and have been given the opportunity to ask questions. I will also be given a copy of this consent form for my records. I hereby consent to my participation in the research described above.

Participant's Signature_____
Date_____

Signature of Investigator or Designee_____

Appendix C
Study Measures

Screening Measures

Do you have any of the following cardiovascular/health conditions?
Heart murmur
Pacemaker
High blood pressure
Taking cardiac medication (e.g., beta blockers)
Pregnant or lactating
I have none of these conditions
Prefer not to Answer

Are you currently diagnosed with an anxiety disorder?
Yes
No
Prefer not to Answer

Are you currently diagnosed with depression?
Yes
No
Prefer not to Answer

Are you currently diagnosed with Post-Traumatic Stress Disorder (PTSD)?
Yes
No
Prefer not to Answer

What sex were you assigned at birth?
Female
Male
Intersex
Prefer not to Answer

What is your race/ethnicity?
African American/Black
American Indian/Alaska Native
Asian/Asian American/ Pacific Islander
Caucasian/White
Hispanic/Latino

Two or More Races
Other
Prefer not to Answer

What is your age?
Free response

Are you currently taking any medications that affect your cardiovascular system, such as beta?
blockers?
1. No
2. Yes

Are you currently taking any type of anti-depressant medication (with or without a prescription;
e.g., Lexapro, Cipralex, Paxil, Seroxat, Prozac, Luvox, Zoloft, or others)?
1. No
2. Yes

Do you smoke tobacco or use chewing tobacco?
1. No
2. Yes

Do you currently use any form of social media (e.g., Facebook, Twitter, Instagram, etc.) at least?
once per day?
1. No
2. Yes

Do you have regular access to a smartphone that allows you to visit social networking sites (e.g.?
Facebook, Twitter, Instagram, etc.) on a daily basis?
1. No
2. Yes

Demographics.

What is highest degree or level or school that you have completed?

1. No school completed
2. Less than 8th grade completed

3. 8th grade completed
4. Some high school, no diploma
5. High school graduate, diploma, or the equivalent (for example: GED)
6. Some college credit, no degree
7. Trade or technical training
8. Associate degree (2 years)
9. Bachelor's degree (4 years)
10. Master's degree (5 to 6 years)
11. Doctorate degree or other terminal professional degree (e.g., MD, JD, DDS; 4 years or more beyond the bachelor's degree)
12. Post-doctoral training

What is your total yearly income, before taxes, excluding any parental, spouse, or other household income?

1. Less than $10,000
2. $10,000 to $19,999
3. $20,000 to $29,999
4. $30,000 to $39,999
5. $40,000 to $49,999
6. $50,000 to $59,999
7. $60,000 to $69,999
8. $70,000 or more

If you have a spouse, partner, parent, friend, or other family member that financially supports you in any way, what do you estimate is their income, before taxes?

1. Less than $10,000
2. $10,000 to $19,999
3. $20,000 to $29,999
4. $30,000 to $39,999
5. $40,000 to $49,999
6. $50,000 to $59,999
7. $60,000 to $69,999
8. $70,000 or more
9. I do not rely on anyone else's income

What was your ACT score?
____ _Not Applicable

What is your cumulative GPA?

Beck depression inventory-II.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). Beck depression inventory-II. *San Antonio*, *78*(2), 490-498.

Select the statement for each question that best describes the way you have been feeling during the PAST TWO WEEKS, including TODAY

0- No changes
1- More than usually
2- A lot more than usual
3- Extreme changes

1. Sadness
2. Pessimism
3. Past Failure
4. Loss of pleasure
5. Guilt feelings
6. Self-dislike
7. Self-criticalness
8. Suicidal thoughts or wishes
9. Crying
10. Agitation
11. Loss of interest
12. Indecisiveness
13. Worthlessness
14. Loss of energy
15. Changes in sleeping pattern
16. Irritability
17. Changes in appetite
18. Concentration difficulty
19. Tiredness
20. Loss of interest in sex

Anxiety inventory.

Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology, 56*, 893–897.

Below is a list of common symptoms of anxiety. Please carefully read each item in the

list. Indicate how much you have been bothered by that symptom during the past month, including today.

0- Not at all
1- Mildly, but it didn't bother me much
2- Moderately-it wasn't pleasant at times
3- Severely-it bothered me a lot

1. Numbness or tingling
2. Feeling hot
3. Wobbliness in legs
4. Unable to relax
5. Fear of the worst happening
6. Dizzy or lightheaded
7. Heart pounding/ racing
8. Unsteady
9. Terrified or afraid
10. Nervous
11. Feeling of choking
12. Hands trembling
13. Shaky/ unsteady
14. Fear or losing control
15. Fear of dying
16. Scared
17. Indigestion
18. Faint/ Lightheaded
19. Face flushed
20. Hot/ cold sweats

Posttraumatic stress disorder checklist-5.

Weathers, F. W., Blake, D. D., Schnurr, P. P., Kaloupek, D. G., Marx, B. P., & Keane, T. M. (2013). The life events checklist for DSM-5 (LEC-5). *Instrument available from the National Center for PTSD at www.ptsd.va.gov*.

Below is a list of problems that people sometimes have in response to a very stressful experience. Please read each problem carefully and then select the numbers to the right to indicate how much you have been bothered by that problem in the past month

0- Not at all

1- A little bit
2- Moderately
3- Quite a bit
4- Extremely

1. Repeated, disturbing, and unwanted memories of the stressful experience?
2. Repeated, disturbing dreams of the stressful experience?
3. Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?
4. Feeling very upset when something reminded you of the stressful experience?
5. Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?
6. Avoiding memories, thoughts, or feelings related to the stressful experience?
7. Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?
8. Trouble remembering important parts of the stressful experience?
9. Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?
10. Blaming yourself or someone else for the stressful experience or what happened after it?
11. Having strong negative feelings such as fear, horror, anger, guilt, or shame?
12. Loss of interest in activities that you used to enjoy?

Trauma checklist.

Wherry, J. N., Huffhines, L. P., & Walisky, D. N. (2016). A short form of the Trauma Symptom Checklist for Children. *Child maltreatment*, *21*(1), 37-46.

Below is a list of scary, dangerous, or violent situations or events that sometimes happen. For the following questions, mark Yes if the event happened to you as a kid or as an adult and check no if it did not happen to you.

1. Being in a big earthquake that badly damaged the building you were in
2. Being in another king of disaster, like a fire, tornado, flood or hurricane
3. Being in a bad accident, like a very serious car accident
4. Being in a place where war was going on around you
5. Being hit, kicked or punch very hard at home (Do NOT include ordinary fights with brothers or sisters)
6. Seeing a family member being hit, kicked or punch very hard at home (Do NOT include ordinary fights with brothers or sisters)

7. Being beaten up, shot at or being threatened to be hurt badly
8. Seeing someone in real like being beaten up, shot at, hurt badly, killed or almost killed
9. Seeing a dead body in real like (DO NOT include funerals)
10. Heading about the violent death or serious injury of a loved one
11. Having a painful and scary medical treatment in a hospital when you were very badly sick or injured
12. Of the questions asked which event was the worst?

Predictor Measures

Race-related media.

1- never
2- 1-3 times a month
3- 2-3 times a week
4- Once a day
5- Multiple times a day

1. How often do you see traditional media coverage (e.g., TV, newspaper, online newspaper, etc.) about the race-related topics (e.g., Black Lives Matter movement, confederate war monuments, etc.)?
2. How often do you see Black Americans portrayed in any form of media(e.g., TV, Facebook, newspaper, etc.)?
3. How often do you see social media coverage (e.g., Facebook, Twitter, etc.) about the race-related topics (e.g., Black Lives Matter movement, confederate war monuments, etc.)?

-2- Very negative
-1 Slightly negative
0- Neither negative nor positive
1- Slightly positive
2- Very positive

4. In general, how would you rate the media (traditional and social) coverage of Black Americans?
5. In general, how would you rate the media (traditional and social) coverage race-related topics (e.g., Black Lives Matter Movement, Confederate war moments, etc.)

Daily race-related media.

1- never
2- 1-3 times a month
3- 2-3 times a week
4- Once a day
5- Multiple times a day

1. Today, how often to you see traditional media coverage (e.g., TV, newspaper, online newspaper, etc.) about race-related topics (e.g., Black Lives Matter movement, confederate war monuments, etc.)?
2. Today, how often do you see social media coverage (e.g., Facebook, Twitter, etc.) about race-related topics (e.g., Black Lives Matter movement, confederate war monuments, etc.)?
3. How often did you see Black Americans portrayed in any form of media today (e.g., TV, Facebook, newspaper, etc.)?

-2- Very negative
-1 Slightly negative
0- Neither negative nor positive
3- Slightly positive
4- Very positive

1- How would you rate the media coverage of Black Americans today?
2- How would you rate the social media coverage of race-related topics seen today (e.g., Black Lives Matter movement, confederate war monuments, etc.)?
3- How would you rate the traditional media (newspaper, TV news broadcasts, etc.) coverage of race-related topics seen today (e.g., Black Lives Matter movement, confederate war monuments, etc.)?

Moderators

Self-esteem.

Rosenberg, M. (1979). *Conceiving the self.* New York, NY: Basic Books.

1- Very strongly disagree
2- Disagree
3- Slightly disagree
4- Slightly agree

5- Agree
6- Very strongly agree

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

Dispositional optimism.

Scheier, M. F., Carver, C. S., & Bridges, M. W. (2001). Optimism, pessimism, and psychological well-being. In E. C. Chang (Ed.), *Optimism and pessimism: Implications for theory, research, and practice* (pp. 189-216). Washington, DC: American Psychological Association.

1- Very strongly disagree
2- Disagree
3- Slightly disagree
4- Slightly agree
5- Agree
6- Very strongly agree

1. In uncertain times, I usually expect the best.
2. If something can go wrong for me, it will.
3. I'm always optimistic about my future.
4. I hardly ever expect things to go my way.
5. I rarely count on good things happening to me.
6. Overall, I expect more good things to happen to me than bad things.
7. I am hopeful about my future.
8. I am a hopeful person.

Perceived control.

Sparks, P., Guthrie, C. A., & Shepherd, R. (1997). The dimensional structure of the perceived behavioral control construct. *Journal of Applied Social Psychology, 27,* 418-438.

1- Very strongly disagree
2- Disagree
3- Slightly disagree
4- Slightly agree
5- Agree
6- Very strongly agree

1. I have little control over the things that happen to me.
2. There is really no way I can solve some of the problems I have.
3. There is little that I can do to change many of the important things in my life.
4. I often feel helpless in dealing with the problems of life.
5. Sometimes I feel that I'm being pushed around in life.
6. What happens to me in the future mostly depends on me.
7. I can do just about anything I really set my mind to.

Ability to cope with discrimination.

Major, B., Richards, C., Cooper, M. L., Cozzarelli, C., & Zubek, J. (1998). Personal resilience, cognitive appraisals, and coping: An integrative model of adjustment to abortion. *Journal of Personality and Social Psychology, 74*, 735–752.

1- Very strongly disagree
2- Disagree
3- Slightly disagree
4- Slightly agree
5- Agree
6- Very strongly agree

1. I personally have what it takes to deal with prejudice and discrimination against Black Americans.
2. I will be able to overcome any problems that prejudice and discrimination against Black Americans might cause for me
3. I will be able to cope well with prejudice against Black Americans.
4. I have the resources I need to successfully handle being the target of racial prejudice.

Experiences with discrimination.

Brondolo, E., Kelly, K., Coakley, V., Gordon, T., Thompson, S., Levy, E., Cassells, A., Tobin, J., Sweeney, M., & Contrada, R. J. (2005). The perceived ethnic discrimination questionnaire: development and preliminary validation of a community version 1. *Journal of Applied Social Psychology, 35*(2), 335-365.

How often have the things listed below ever happened to you, <u>because of your ethnicity/race?</u>

1- Never happened to me
2- Happened to me only once or twice
3- Sometimes happens to me
4- Happens to me frequently
5- Happens very often

1. People have been nice to your face, but said bad things behind your back
2. People made you feel like an outsider because of your appearance
3. Those speaking a different language made you feel like an outsider
4. People ignored you
5. People hinted that you are stupid
6. A clerk or waiter ignored you
7. Someone called you bad names
8. Someone made rude gestures
9. Someone hinted you must be lazy
10. Someone hinted you must not be clean
11. Someone hinted you were dishonest
12. Someone didn't trust you
13. Someone hinted you must be violent
14. Someone didn't take you seriously
15. You were treated unfairly by coworkers
16. You were treated unfairly by your boss or supervisor
17. You were treated unfairly by teachers
18. People thought you couldn't do things/handle a job
19. Someone actually hurt you
20. Someone threatened to hurt you
21. Someone actually damaged your property
22. Someone threatened to damage your property

Racial Identity

Sellers, R. M., Smith, M. A., Shelton, J. N., Rowley, S. A. J., & Chavous, T. M. (1998). Multidimensional model of racial identity: A reconceptualization of African American racial identity. *Personality and Social Psychology Review*, *2*, 18–39.

1- Very strongly disagree
2- Strongly disagree
3- Disagree
4- Agree
5- Strongly agree
6- Very strongly agree

1. Overall, being Black has very little to do with how I feel about myself.
2. I feel good about Black people.
3. Overall, Blacks are considered good by others.
4. In general, being Black is an important part of my self-image.
5. I am happy that I am Black.
6. I feel that Blacks have made major accomplishments and advancements.
7. My destiny is tied to the destiny of other Black people.
8. Being Black is unimportant to my sense of what kind of person I am.
9. In general, others respect Black people.
10. Most people consider Blacks, on the average, to be more ineffective than other racial groups
11. I have a strong sense of belonging to Black people.
12. I often regret that I am Black.
13. I have a strong attachment to other Black people.
14. Being Black is an important reflection of who I am.
15. Being Black is not a major factor in my social relationships
16. Blacks are not respected by the broader society.
17. In general, other groups view Blacks in a positive manner.
18. I am proud to be Black.
19. I feel that the Black community has made valuable contributions to this society.
20. I feel that the Black community has made valuable contributions to this society
21. Society views Black people as an asset.

Race rejection sensitivity.

Mendoza-Denton, R., Downey, G., Purdie, V., Davis, & Pietrzak, J. (2002). Sensitivity to status based rejection: Implications for African American students' college experience. *Journal of Personality and Social Psychology, 83,* 896-918

1- Very unconcerned
2- Unconcerned
3- somewhat unconcerned
4- somewhat concerned
5- Concerned
6- very concerned

1- Very unlikely
2- Slightly unlikely
3- Unlikely
4- Likely
5- Slightly likely
6- Very likely

1. Imagine that you are in class one day, and the professor ask a particularly difficult question. A few people, including yourself, raise their hands to answer the question.

1a) How concerned/anxious would you be that the professor might not choose you cause of your race/ethnicity?
1b) I would expect that the professor might not choose me because of my race/ethnicity

2. Imagine that you are in a pharmacy, trying to pick out a few items. While you're looking at the different brands, you notice one of the store clerks glancing your way.

2a) How concerned /anxious would you be that the clerk might be looking at you because of your race/ethnicity?
2b) I would expect that the clerk might continue to look at me because of my race/ethnicity.

3. Imagine you have just completed a job interview over the telephone. You are in good spirits because the interviewer seemed enthusiastic about your application. Several days later you complete a second interview in person. Your interviewer informs you that they will let you know about their decision soon

3a) How concerned/anxious would you be that you might not be hired because of your race/ethnicity?
3b) I would expect that I might not be hired because of my race/ethnicity.

4. It's late at night and you are driving down a country road you're not familiar with. Luckily, there is a 24-hour 7-11 just ahead, so you stop there and head up to the counter to ask the young woman for directions.

4a) How concerned/anxious would you be that she might not help you because of your race/ethnicity?
4b) I would expect that the woman might not help me because of my race/ethnicity.

5. Imagine that a new school counselor is selecting students for a summer scholarship fund that you really want. The counselor has only one scholarship left and you are one of several students that is eligible for this scholarship

5a) How concerned/anxious would you be that the counselor might not choose you because of your race/ethnicity?
5b) I would expect that he might not select me because of my race/ethnicity

6. Imagine you have just finished shopping, and you are leaving the store carrying several bags. It's closing time, and several people are filing out of the store at once. Suddenly, the alarm begins to sound, and a security guard comes over to investigate.

6a) How concerned/anxious would you be that the guard might stop you because of your race/ethnicity?
6b) I would expect that the guard might stop me because of my race/ethnicity

7. Imagine you are riding the bus one day. The bus is full except for two seats, one of which is next to you. As the bus comes to the next stop, you notice a woman getting on the bus.

7a) How concerned/anxious would you be that she might avoid sitting next to you because of your race/ethnicity?
7b) I would expect that she might not sit next to me because of my race/ethnicity

8. Imagine that you are in a restaurant, trying to get the attention of your waitress. A lot of other people are trying to get her attention as well.

8a) How concerned/anxious would you be that she might not attend you right away because of your race/ethnicity?
8b) I would expect that she might not attend to me right away because of my race/ethnicity

9. Imagine you're driving down the street, and there is a police barricade just ahead. The police officers are randomly pulling people over to check drivers' licenses and registrations.

9a) How concerned/anxious would you be that an officer might pull you over because of your race/ethnicity?
9b) I would expect that the officers might stop me because of my race/ethnicity.

10. Imagine that it's the second day of your new class. The teacher assigned a writing sample yesterday and today the teacher announces that she has finished correcting the papers. You wait for your paper to be returned.

10a) How concerned/anxious would you be that you might receive a lower grade than others because of your race/ethnicity?
10b) I would expect to receive a lower grade than others because of my race/ethnicity.

11. Imagine that you are standing in line for the ATM machine, and you notice the woman at the machine glances back while she's getting her money

11a) How concerned/anxious would you be that she might be suspicious of you because of your race/ethnicity
11b) I would expect that she might be suspicious of me because of my race/ethnicity.

12. Imagine you're at a pay phone on a street corner. You have to make a call, but you don't have change. You decide to go into a store and ask for change for your bill.

12a) How concerned/anxious would you be that the cashier might not give you change because of your race/ethnicity
12b) How concerned/anxious would you be that the cashier might not give you change because of your race/ethnicity?

Activism orientation scale.

Corning, A. F., & Myers, D. J. (2013). Activism orientation scale (AOS). *Measurement instrument database for the social science.* Retrieved from www.midss.ie

The following questions are about your level of activism for social justice issues regarding racial equality. How likely it is that you will engage in each of the following activities in the future?

1- Extremely unlikely
2- Very Unlikely
3- Unlikely
4- Likely
5- Very likely
6- Extremely likely

1. Display a poster or bumper sticker with a race-related social justice message, such as Black Lives Matter?
2. Invite a friend to attend a meeting of a race-related social justice organization or event?
3. Purchase a poster, t-shirt, etc. that endorses a race-related social justice point of view such as Black Lives Matter?
4. Serve as an officer in a race-related social justice organization, like NAACP?
5. Engage in a race-related social justice activity in which you know you will be arrested, e.g., riots or protest?
6. Organize a race-related social justice event?
7. Present facts to confront another person's inappropriate racial statement?
8. Engage in a physical confrontation at a race-related social justice rally?
9. Send a letter or email expressing a race-related social justice opinion to the editor of a television show?
10. Engage in a race-related social justice activity in which you feared that some of your possessions would be damaged?
11. Engage in an illegal act as a part of a race-related social justice protest?
12. Confront jokes, statements, or innuendoes that opposes a race-related social justice group's cause?
13. Engage in a race-related social justice activity in which you suspect there would be a confrontation with the police or a possible arrest?
14. Attend a talk on a race-related social justice group's social concerns?
15. Encourage a friend to join a race-related social justice organization?
16. Block access to a building or public area with your body during race-related social justice event?
17. Wear a t-shirt or button with a race-related social justice message?
18. Engage in any race-related social justice activity in which you fear for your personal safety?
19. Use a hashtag on social media site promoting race-related social justice (e.g., #blacklivesmatter, #handsupdontshoot, etc.)

20. Post on social media site promoting race-related social justice (e.g., article, status, tweet, etc.)

Health Outcomes

Perceived stress scale.

Cohen, S., Kamarck, T., & Mermelstein, R. (1994). Perceived stress scale. *Measuring stress: A guide for health and social scientists*, 235-283.

1- Never
2- Rarely
3- Sometimes
4- Fairly often
5- Often

1. How often are you upset because something happens unexpectedly?
2. How often do you feel that you are unable to control the important things in your life?
3. How often do you feel nervous or stressed?
4. How often do you feel confident in your abilities to handle your personal problems?
5. How often do you feel that things are going your way?
6. How often do you find that you are not able to cope with all the things you have to do?
7. How often are your able to control irritations in your life?
8. How often do you feel that you are on top of things?
9. How often are you angered because of things outside of your control?
10. How often do you feel difficulties were piling up so high that you cannot overcome them?

Perceived stress scale (part three).

Adapted from:
Cohen, S., Kamarck, T., & Mermelstein, R. (1994). Perceived stress scale. *Measuring stress: A guide for health and social scientists*, 235-283.

1- Never
2- Rarely
3- Sometimes

4- Fairly Often
5- Often

Thinking about today

1. How often were you upset because something happened unexpectedly?
2. How often did you feel that you were unable to control the important things in your life?
3. How often did you feel nervous or stressed?
4. How often did you feel confident in your abilities to handle your personal problems?
5. How often did you feel that things were going your way?
6. How often did you find that you were not able to cope with all the things you had to do?
7. How often were your able to control irritations in your life?
8. How often did you feel that you were eon top of things?
9. How often were you angered because of things outside of your control?
10. How often did you feel difficulties were piling up so high that you could not overcome them?

Self-esteem (part three).

Rosenberg, M. (1979). *Conceiving the self.* New York, NY: Basic Books.

1- Very strongly disagree
2- Disagree
3- Slightly disagree
4- Slightly agree
5- Agree
6- Very strongly agree

1. On a whole, I am satisfied with myself today.
2. At times today I thought I am no good at all.
3. Today I feel that I have a number of good qualities
4. Today I was able to do things as well as most other people
5. Today I feel I do not have much to be proud of
6. Today I feel useless at times
7. Today I felt that I'm a person of worth at least on an equal plane with others
8. Today I wish I could have had more respect for myself
9. Today I felt like a failure

10. Today I had a positive attitude toward myself.

Multiple affective adjective check-list

Adapted from:
Zuckerman, M., & Lubin, B. (1985). *Manual for the MAACL-R: The Multiple Affect Adjective Check List Revised*. Educational and Industrial Testing Service.

Please indicate how frequently you experience each of the following mood or emotions today

1- Never
2- Almost never
3- Rarely
4- Frequently
5- Almost always
6- Always

1- Unhappy
2- Happy
3- Sad
4- Joy
5- Anger
6- Contentment
7- Anxiety
8- Excitement

Part 2 Measures

1. How old are you? _____
2a. How tall are you? _____
2b. How much do you weigh? _____
3. Are you currently taking any prescriptions or non-prescription drugs other than topical ointments and creams? If yes, please list them here: include medication such as inhalers, allergy medications, diet pills, etc.

---

4. Have you taken any of these medication in the last 24 hours? _____Yes _____No

If yes, please list

_____

5. Do you have any health problems that might affect your ability to participate in this study? If yes, please list them here:

6a. What date did your last menstrual period begin on? _____ Month _____Day

b. How long is your typical cycle? _____ Days

c. Are you currently taking hormonal contraceptives? _____Yes _____No

How would you rate the current level of stress in your life?

_____Extremely Stressful _____Moderately Stressful _____Mildly Stressful _____Minimally stressful

8. Do you smoke? _____ Yes _____No If yes, how many cigarettes a day? _____ or packs? _____

9. Have you engaged in cardiovascular exercise within the last 2 hours _____Yes _____No

10. In the past 6 months have you:

Had mono? _____Yes _____No

Had malaria? _____Yes _____No

Had surgical procedures that require anesthesia? _____Yes _____No

11. In the past 45 minutes have you:

Ate any type of food? _____Yes _____No

Drank any liquids? _____Yes _____No

If yes, what and how long ago? _____

Brushed your teeth? _____Yes _____No

Chewed Gum? _____Yes _____No

If yes, how long ago? _____

Smoked a cigarette? _____Yes _____No

Supplementary Measures

Part 1

Perceived racism media (part three).

Adapted from:

Brondolo, E., Kelly, K., Coakley, V., Gordon, T., Thompson, S., Levy, E., Cassells, A., Tobin, J., Sweeney, M., & Contrada, R. J. (2005). The perceived ethnic

discrimination questionnaire: development and preliminary validation of a community version 1. *Journal of Applied Social Psychology, 35*(2), 335-365.

1- Never happened to me
2- Happened to me only once or twice today
3- Happened to me a few times
4- Happened to me frequently today
5- Happened very often today

Thinking about today

1. People were nice to your face, but said bad things about your race on social media
2. On the media, people made you feel like an outsider because of your appearance
3. People hinted on the media that you are stupid because of your race
4. Someone called you bad names on a form of media because of your race
5. Someone made rude gestures on a form of media because of your race
6. Someone hinted you must be lazy on a form of media because of your race
7. Someone hinted you must not be clean on a form of media because of your race
8. Someone hinted you were dishonest on a form of media because of your race
9. Someone didn't trust you on a form of media because of your race
10. Someone hinted you must be violent on a form of media because of your race
11. Someone didn't take you seriously on a form of media because of your race
12. Someone threatened to hurt you on a form of media because of your race
13. Someone threatened to damage your property on a form of media because of your race

1- Very negative
2- Slightly negative
3- Neither negative nor positive
4- Slightly positive
5- Very positive

1. In your opinion, how supportive are people in the United States of race-related movements and issues (e.g., Black Lives Matter Movement, Confederate war moments, etc.) on media (traditional and social)?
2. In your opinion, how supportive are people in the St. Louis area of race-related movements and issues (e.g., Black Lives Matter Movement, Confederate war moments, etc.) on media (traditional and social)?

1- Not at All Familiar
2- Not Familiar

3- Somewhat Familiar
4- Familiar
5- Very familiar

3. How familiar are you with the details of the shooting of Michael Brown?
4. How familiar are you with the details of the shooting of Trayvon Martin?
5. How familiar are you with the details of the shooting of Tamir Rice?
6. How familiar are you with the details of the shooting of Alton Sterling?
7. How familiar are you with the details of the shooting of Philando Castile?
8. How familiar are you with the case of Eric Garner?
9. How familiar are you with the case of Freddie Gray?
10. How familiar are you with the case of Sandra Bland?

Health-related quality of life questionnaire.

U.S Department of Health and Human Services, Center for Disease Control and Prevention. (2000). Assessment of health-related quality of life, Measuring Healthy Days.

1. Would you say in general your health is
Excellent
Very good
Good
Fair
Poor
Don't know/Not sure

2. Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?
Number of days_____
Don't know/Not sure

3. Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?
Number of days_____
Don't know/Not sure

4. During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usually activities, such as self-care, work, or recreation?

Number of days_____
Don't know/Not sure

5. Are you limited in any way in any activities because of any impairment or health problems?
Yes
No

5a. If yes, state how and why you are limited

6. During the past 30 days, on about how many of them were you feeling sick or ill?
Number of days_____
Don't know/Not sure

7. During the past 30 days, for about how many days did pain or sickness make it hard for you to do you usual activities?
Number of days_____
Don't know/Not sure

8. During the past 30 days, for about how many days have you felt sad, blue, or depressed?
Number of days_____
Don't know/Not sure

9. During the past 30 days, for about how many days have you felt worried, tense, or anxious?
Number of days_____
Don't know/Not sure

10. During the past 30 days for about how many days have you felt that you did not get enough rest or sleep?
Number of days_____
Don't know/Not sure

11. During the past 30 days, for about how many days have you felt very healthy or full or energy?
Number of days_____
Don't know/Not sure

Brief symptom inventory.

Derogatis, L. R. (1994). Symptom Checklist 90r (SCL-90R) Administration, Scoring, and Procedures Manual, 3rd edn. Minneapolis, MN: National Computer Systems.

1- Not at all
2- Very slightly
3- A little
4- Moderately
5- Quite a bit
6- Extremely

1. Nervousness or shakiness inside
2. Suddenly scared for no reason
3. Feeling fearful
4. Feeling tense or keyed up
5. Spells of terror or panic
6. Feeling so restless you couldn't sit still
7. Feeling lonely
8. Feeling blue
9. Feeling no interest in things
10. Feeling hopeless about the future
11. Feelings of worthlessness
12. Your feelings being easily hurt
13. Feeling that people are unfriendly or dislike you
14. Feeling inferior to others
15. Feeling very self-conscious with others

Social network Sites Usage questionnaire.

Yuanyuan, S., Yu L., Ziyan, Y, Yunzhi, L., and Huakian, C. (2014). The development and validation of the Social Network Sites (SNSs) Usage Questionnaire. *Social Computing and Social Media, 8531,* 113-124.

Which of the following Social Networking Sites do you currently use? (Check all the apply)

Facebook
Twitter
LinkedIn
Google+
YouTube
Instagram

Pinterest
Tumblr
Vine
Snapchat
Reddit
Flickr
Swarm by Foursquare
Kik
Yik Yak
Shots
Periscope
Medium
Sound Cloud
Tinder
WhatsApp
Slack
Musically
Peach
Blab
Yelp
Others: (write in)

When answering the following questions, think about the Social Networking Sites (SNS) you checked in the question above.

Please try to recall the daily usage of Social Network Sites (SNS)
1-never
2-yearly
3-monthly
4-weekly
5-multiple times a week
6-daily
7-multiple times a day

1. How frequently do you common on others' notes, posts, or photos on SNS?
2. How frequently do you use SNS?
3. How frequently do you send private messages on SNS?
4. How frequently do you update your status on SNS?
5. How frequently do you write notes, posts, or blogs on SNS?
6. How frequently do you update your profile image on SNS?
7. How frequently do you post photos on SNS?

8. How frequently do you visit your friends' homepage on SNS?
9. How frequently do you check others' comments or messages on SN?
10. How frequently do you get the news on SNS?
11. In your favorite SNS, what is the composition of your friends?
12. On average, each time you visit SNS, how long do you spend on it
13. In your favorite SNS, how many friends do you have

Please indicate how frequently you experience the following moods when using SNS?
1-never
2-almost never
3-rarely
4-sometimes
5-frequently
6-almost
7-never

1. Unhappiness
2. Happiness
3. Sadness
4. Joy
5. Anger
6. Contentment
7. Anxiety
8. Excitement

Facebook intensity scale.

Ellison, N., Steinfield, C., and Lampe, C. (2007). The benefits of Facebook "friends:" social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication, 12,* 1143-1168

1- Very strongly disagree
2- Strongly disagree
3- Disagree
4- Agree
5- Strongly agree
6- Very strongly agree

1. Facebook is part of my everyday life
2. I am proud to tell people I'm on Facebook
3. Facebook has become part of my daily routine

4. I feel out of touch when I haven't logged onto Facebook for awhile
5. I feel I am part of the Facebook community
6. I would be sorry if Facebook shut down

Social network intrusiveness.

Espinoza, G., & Juvonen, J. (2011). The pervasiveness, connectedness, and intrusiveness of social net work site use among young adolescents. *Cyberpsychology, Behavior, and Social Networking, 00*, 1-5

1- 1-3 times
2- 4-6 times
3- 7-12 times
4- More than 12 times

Thinking about the last month:

1. How often have you lost sleep because you were visiting a social networking site?
2. How often have you come to class late because you were visiting a social networking site?
3. How often have you gotten behind on schoolwork because you were visiting a social networking site?
4. How often have you not paid attention in class because you were visiting social networking sites?
5. How often does visiting social networking sites interfere with accomplishing your responsibilities?

Thinking about the last week:

1. How often have you lost sleep because you were visiting a social networking site?
2. How often have you come to class late because you were visiting a social networking site?
3. How often have you gotten behind on schoolwork because you were visiting a social networking site?
4. How often have you not paid attention in class because you were visiting social networking sites?
5. How often does visiting social networking sites interfere with accomplishing your responsibilities?

Social media impact on relationships.

Adapted from:

Chambliss C, Short E, Hopkins-DeSantis J, Putnam H, Martin B, Millington M, Frymoyer A, Rodriguez G, Evangelista L, Newman J, Hartl A. Young Adults' Experience of Mobile Device Disruption of Proximate Relationships. *Journal ISSN*. 2368, 6103

1- Never
2- Rarely
3- Sometimes
4- Often
5- Almost Always

1. Do you pay attention to social media sites when you are talking with a friend or significant other in person?
2. Does it bother you to pay attention to social media when interacting with a friend in person?
3. Do you use cell phones or tablets to access social media sites while friends are talking to you in person?
4. I expect a close friend or significant other to respond to my social media site message within:
    a. 5 min
    b. 15 min
    c. 1 hour
    d. 6 hours
    e. A day
    f. Two Days
    g. The Week

5. When on a date or with friends, I feel comfortable not checking social media sites for:
    a. 5 min
    b. 15 min
    c. 1 hour
    d. 6 hours
    e. A day

6. During a first date, when a message on social media comes in I usually:
    a. Turn off my phone when on dates

b. Ignore my phone
c. Check to see if it is an emergency
d. Quickly respond
e. Engage in the text/phone conversation
f. Not applicable

7. When going out to dinner with my long-term partner or friend, when a message on social media comes in I usually:
    a. Turn off my phone when on dates
    b. Ignore my phone
    c. Check to see if it is an emergency
    d. Quickly respond
    e. Engage in the text/phone conversation
    f. Not applicable

Scale for online social capital.

Williams, D. (2006). On and off the 'net: scales for social capital in an online era. *Journal of Computer-Mediated Communication*, *11,* 593–628.

Please indicate how strongly you agree or disagree with each statement.

1- Strongly disagree
2- disagree
3- somewhat disagree
4- somewhat agree
5- agree
6-strongly agree

1. There are several people online I trust to help solve my problems
2. There is someone online I can turn to for advice about making very important decisions
3. There is no one online that I feel comfortable talking to about intimate personal problem
4. When I feel lonely, there are several people online I can talk to
5. If I needed an emergency loan of $500, I know someone online I can turn to
6. The people I interact with online would put their reputation on the line for me
7. The people I interact with online would share their last dollar with me
8. I do not know people online well enough to get them to do anything important
9. The people I interact with online would help me fight injustice.

Social media reliance.

Hawi, N. S., & Samaha, M. (2016). The relations among social media addiction, self-esteem, and life satisfaction in university students. *Social Science Computer Review,* 1-11.

Please indicate how strongly you agree or disagree with each statement.

1- Strongly disagree
2- disagree
3- somewhat disagree
4- somewhat agree
5- agree
6-strongly agree

1. I often think about social media when I am not using it
2. I often use social media for no particular reason
3. Arguments have arisen with others because of my social media use
4. I interrupt whatever else I am doing when I feel the need to be on social media
5. I feel connect to others when I use social media
6. I lose track of how much I am using social media
7. The thought of not being able to access social media makes me feel distressed
8. I have been unable to reduce my social media use

1- Never or hardly ever
2- Only once
3- Sometimes
4- Somewhat Often
5- Very Often
6- Always or

1. It is important for me to check social media at least once every day
2. I use social media when I am face to face with one other person
3. I feel fine even when I go long periods without checking social media
4. I get on social media in the bathroom
5. I feel more attached to social media than to most other things
6. It bothers me when I am asked to stay off social media for long periods of time
7. I get on social media late at night when others are usually sleeping
8. I find myself checking my social media without making a conscious effort
9. I am tempted to check social media at meetings, at work, or in class

10. It bothers me if I have not checked my social media for a few hours
11. Whenever something important happens, I immediately post it on social media
12. Getting on social media helps me relax when I am under stress

Part 3

Social Network Sites Usage questionnaire

Yuanyuan, S., Yu L., Ziyan, Y, Yunzhi, L., and Huakian, C. (2014). The development and validation of the Social Network Sites (SNSs) Usage Questionnaire. *Social Computing and Social Media, 8531,* 113-124.

Which of the following Social Networking Sites did you use today? (Check all the apply)

Facebook
Twitter
LinkedIn
Google+
YouTube
Instagram
Pinterest
Tumblr
Vine
Snapchat
Reddit
Flickr
Swarm by Foursquare
Kik
Yik Yak
Shots
Periscope
Medium
Sound Cloud
Tinder
WhatsApp
Slack
Musical.ly
Peach
Blab
Yelp

Others: (write in)

When answering the following questions, think about the Social Networking Sites (SNS) you checked in the question above.

Please try to recall the daily usage of Social Network Sites (SNS)

1- Never
2- Once today
3- 2-5 times today
4- every few hours
5- nearly every hour

1. How frequently today did you common on others' notes, posts, or photos on SNS
2. How frequently today did you use SNS?
3. How frequently today did you send private messages on SNS?
4. How frequently today did you update your status on SNS?
5. How frequently today did you write notes, posts, or blogs on SNS?
6. How frequently today did you update your profile image on SNS?
7. How frequently today did you post photos on SNS?
8. How frequently today did you visit your friends' homepage on SNS?
9. How frequently today did you check others' comments or messages on SN?
10. How frequently today did you get the news on SNS?
11. On average today, each time you visit SNS, how long do you spend on it

Thinking about today

1. I lost sleep because I was visiting a social networking site(s).
2. I was late to class or work because I was visiting a social networking site(s).
3. I fell behind on schoolwork because I was visiting a social networking site(s).
4. I paid less attention in class because I was visiting social networking sites
5. Visiting social networking sites interfered with accomplishing my daily responsibilities

Social media impact on relationships

Adapted from:

Chambliss C, Short E, Hopkins-DeSantis J, Putnam H, Martin B, Millington M, Frymoyer A, Rodriguez G, Evangelista L, Newman J, Hartl A. Young Adults' Experience of Mobile Device Disruption of Proximate Relationships. *Journal ISSN*. 2368, 6103

1. Today, did you pay attention to social networking sites when you are talking with a friend or significant other in person?
2. Today did you use cell phones or tablets to access social networking sites while friends are talking to you in person?

Experiences with discrimination.

Brondolo, E., Kelly, K., Coakley, V., Gordon, T., Thompson, S., Levy, E., Cassells, A., Tobin, J., Sweeney, M., & Contrada, R. J. (2005). The perceived ethnic discrimination questionnaire: development and preliminary validation of a community version 1. *Journal of Applied Social Psychology, 35*(2), 335-365.

Thinking about today, how often have the things listed below happened to you, <u>because of your ethnicity/race?</u>

1- Never happened to me
2- Happened to me only once or twice today
3- Happened to me a few times
4- Happened to me frequently today
5- Happened very often today

1. People have been nice to your face, but said bad things behind your back
2. People made you feel like an outsider because of your appearance
3. Those speaking a different language made you feel like an outsider
4. People ignored you
5. People hinted that you are stupid
6. A clerk or waiter ignored you
7. Someone called you bad names
8. Someone made rude gestures
9. Someone hinted you must be lazy
10. Someone hinted you must not be clean
11. Someone hinted you were dishonest
12. Someone didn't trust you
13. Someone hinted you must be violent
14. Someone didn't take you seriously
15. You were treated unfairly by coworkers
16. You were treated unfairly by your boss or supervisor
17. You were treated unfairly by teachers
18. People thought you couldn't do things/handle a job
19. Someone actually hurt you

20. Someone threatened to hurt you
21. Someone actually damaged your property
22. Someone threatened to damage your property

Appendix D
Descriptive Statistics

Table D1

Descriptive statistics for participants reporting baseline (time one) frequency of exposure to positive or negative race-related media

Frequency of exposure to positive or negative race-related media	Percent of participants reporting
High frequency of exposure to negative race-related media	18.4% (*n* = 26)
Medium frequency of exposure to negative race-related media	44% (*n* = 63)
Medium frequency of exposure to positive race-related media	35.5% (*n* = 50)
High frequency of exposure to positive race-related media	2.1% (*n* = 3)

Table D2

Descriptive statistics for participants reporting daily frequency of exposure to positive or negative race-related media

Frequency of exposure to positive or negative race-related media	Percent of participants reporting
High frequency of exposure to negative race-related media	4.2% (*n* = 2)
Medium frequency of exposure to negative race-related	60.4% (*n* = 29)
Medium frequency of exposure to positive race-related media	35.4% (*n* = 17)
High frequency of exposure to positive race-related media	0% (*n* = 0)

Table D3

Descriptive statistics for variables included and controlled in hypothesis testing

	Mean	SD	Minimum	Maximum
Age	21.13	2.46	18	30
Time and BMI				
Height (in.)	64.88	3.04	56.00	75.00
Weight (lbs.)	171.63	46.62	102.00	300.00

Body mass index (BMI)	28.75	7.83	16.95	48.42
Time of baseline sample	1:17 PM	1 H 1 M	11:38 AM	3:40 PM
Time of first sample	7:48 AM	1 H 23 M	5:20 AM	10:24 AM
Time of second sample	8:24 AM	1 H 36 M	5:50 AM	1:26 PM
Time of third sample	-	6 H 40 M	12:50 AM	11:48 PM
Hours awake	15.36	1.68	8.67	18.00
Cortisol and DHEA Variables				
Baseline cortisol*	.21	.089	.048	.567
Baseline DHEA	276.94	86.90	112.61	499.90
First sample cortisol*	.38	.25	.08	1.47
Second sample cortisol*	.59	.66	.04	4.16
Third cortisol levels*	.27	.61	.03	4.11
First sample DHEA	404.50	187.16	111.93	895.76
Second sample DHEA	420.02	192.90	98.40	892.17
Third DHEA levels	250.78	114.94	104.97	632.35
Predictors, moderators, and outcomes				
Raw baseline frequency of exposure to positive or negative race-related media	-1.39	3.99	-10.00	7.33
Raw daily frequency of exposure to positive or negative race-related media	-.608	1.80	-6.11	2.67
Trait self-esteem	4.57	.892	2.67	6.00
Optimism	4.28	.691	2.75	6.00
Perceived control	2.12	.708	1.00	3.86
Cope with discrimination	4.28	1.10	1.00	6.00
Experiences with discrimination	2.06	.655	1.05	5.00
Racial identity	4.24	.578	1.00	5.25
Race-rejection sensitivity	3.00	.902	1.0	5.17

Activism orientation	3.58	1.07	1.00	6.00
Daily stress	2.33	.631	1.13	3.60
Daily state self-esteem	2.13	.771	1.00	5.13
Daily affect	4.25	.580	3.08	5.50

Note. M and *SD* are used to represent mean and standard deviation, respectively. *Cortisol values indicated are raw scores, cortisol values used in analysis are natural log transformed as demonstrated by prior research

Table D4

Correlations among moderator variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8
1. Trait self-esteem	4.57	.89								
2. Optimism	4.28	.69	.733**							
3. Perceived control	2.12	.71	-.508**	-.436**						
4. Ability to cope with discrimination	4.28	1.10	.096	.173*	-.112					
5. Experiences with discrimination	2.06	.65	-.352**	-.216*	.190*	.084				
6. Race identity	4.24	.58	.327**	.313**	-.181*	.127	.007			
7. Race rejection sensitivity	3.00	.90	-.273**	-.201*	.226**	.059	.204*	.132		
8. Activism	3.58	1.01	.097	.049	-.057	.210*	.089	.408**	.30**	

Note. M and *SD* are used to represent mean and standard deviation, respectively. *indicates $p < .05$. ** indicates $p < .01$.

Table D5
Correlations among predictor variables

Variable	*M*	*SD*	1	2
1. Baseline frequency of exposure to positive or negative race-related media	.354	.482		
2. Daily frequency of exposure to positive or negative race-related media	.368	.484	-.034	

Note. M and *SD* are used to represent mean and standard deviation, respectively. *indicates $p < .05$. ** indicates $p < .01$.

Table D6
Correlations among outcome variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1. Part one self-reported stress	2.63	.501												
2. Part one self-esteem	4.57	.892	-.472**											
3. Part one affect	5.04	.710	-.356**	.270										
4. Baseline cortisol	-1.66	.424	-.340*	.061	.102									
5. Baseline DHEA	276.94	86.90	-1.06	.090	.153	.496								
6. Daily stress	2.33	.631	.526**	-.355*	-.390**	-1.49	-.076							
7. Daily state self-esteem	2.13	.771	.286*	-.093	-.337*	-.024	.029	.717**						

8. Daily affect	4.25	.580	-.286*	.124	.650**	-.004	.067	-.485**	-.401**						
9. Cortisol slope	.057	.044	.130	.059	-.040	-.043	-.209	.194	.140	-.126					
10. DHEA slope	10.13	10.93	.140	-.021	-.083	-.049	.164	.259	.381**	-.037	.495**				
11. Cortisol awakening response	-.513	.903	-.132	-.026	-.075	.071	-.019	-.149	-.049	.023	.189	.020			
12. DHEA awakening response	-36.41	236.15	.001	.021	.054	.064	-.022	-.066	-.047	-.078	.235	.256	.536**		

Note. M and *SD* are used to represent mean and standard deviation, respectively. *indicates $p < .05$. ** indicates $p < .01$.

Table D7

Correlations among predictor outcome variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Baseline frequency of exposure to positive or negative race-related media	.354	.482														
2. Daily frequency of exposure to positive or negative race-related media	.368	.484	-.034													

3. Part one self-reported stress	2.63	.501	-.012	.043											
4. Part one self-esteem	4.57	.892	.129	-.091	-.472**										
5. Part one affect	5.04	.710	.136	.185	-.356**	.270									
6. Baseline cortisol	-1.66	.424	.315*	.032	-.340*	.061	.102								
7. Baseline DHEA	276.9	86.90	.298*	.154	-1.06	.090	. 153	.496							
8. Daily stress	2.33	.631	-.043	-.237	.526**	-.355*	-.390**	-1.49	-.076						
9. Daily state self-esteem	2.13	.771	-.013	-.009	.286*	-.093	-.337*	-.024	.029	.717**					
10. Daily affect	4.25	.580	.003	.292*	-.286*	.124	.650**	-.004	.067	-.485**	-.401**				
11. Cortisol slope	.057	.044	.002	-.125	.130	.059	-.040	-.043	-.209	.194	.140	-.126			
12. DHEA slope	10.13	10.93	.095	-.004	.140	-.021	-.083	-.049	.164	.259	.381**	-.037	.495**		
13. Cortisol awakening response	-.513	.903	.085	-.194	-.132	-.026	-.075	.071	-.019	-.149	-.049	.023	.189	.020	
14. DHEA awakening response	-36.41	236.15	-.120	-.166	.001	.021	.054	.064	-.022	-.066	-.047	-.078	.235	.256	536**

Note. M and *SD* are used to represent mean and standard deviation, respectively. *indicates $p < .05$. ** indicates $p < .01$.

Table D8
Correlations among outcome and moderator variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10
1. Baseline frequency of exposure to positive or negative race-related media	.354	.482										
2. Daily frequency of exposure to positive or negative race-related media	.368	.484	-.034									
3. Trait self-esteem	4.57	.89	.129	-.091								
4. Optimism	4.28	.69	.119	-.087	.733**							
5. Perceived control	2.12	.71	-.147	.137	-.508**	-.436**						
6. Ability to cope with discrimination	4.28	1.10	-.027	-.221	.096	.173*	-.112					
7. Experiences with discrimination	2.06	.65	.055	-.148	-.352**	-.216*	.190*	.084				
8. Race identity	4.24	.58	.082	.063	.327**	.313**	-.181*	.127	.007			
9. Race rejection sensitivity	3.00	.90	-.060	-.224	-.273**	-.201*	.226**	.059	.204*	.132		
10. Activism	3.58	1.01	-.117	-.216	.097	.049	-.057	.210*	.089	.408**	.30**	

Note. M and *SD* are used to represent mean and standard deviation, respectively. *indicates $p < .05$. ** indicates $p < .01$.

Appendix E
Hypothesis 3 Regression Interaction Results

Table E1

Hypothesis 3a1. Interaction of Baseline Predictor and Outcomes as Moderated by Trait Self-Esteem

	Outcomes							
	Baseline Cortisol				Baseline DHEA			
Predictors	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2
Daily frequent exposure to race-related media	.010	.118	.450	.010	-1.899	3.86	.629	.0054

Note. Cortisol values used in analysis are natural log transformed as demonstrated by prior research. b, *SE*, *p,* and ΔR are used to represent slope, standard error, significance, and variability, respectively.

Table E2

Hypothesis 3a.2 Interaction of Daily Predictor and Outcomes as Moderated by Trait Self-Esteem

	Outcomes															
	Cortisol Slope				DHEA Slope				CAR				DAR			
Predictors	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2
Frequent exposure to positive or negative race-related media	-.008	.003	.026	.109	-2.03	.864	.023	.112	-.068	.071	.324	.019	-13.91	18.85	.464	.011

Note. Cortisol values used in analysis are natural log transformed as demonstrated by prior research. b, *SE*, *p,* and ΔR are used to represent slope, standard error, significance, and variability, respectively. Cortisol slope and DHEA slope are rate of diurnal decline in cortisol and DHEA, respectively, and CAR (cortisol awakening response) and DAR (DHEA awakening response) are measurements of morning spike in biomarker activity 30 minutes after waking up

Table E3

Hypothesis 3b.1. Interaction of Baseline Predictor and Outcomes as Moderated by Optimism

	Outcomes							
	Baseline Cortisol				Baseline DHEA			
Predictors	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2
Daily frequent exposure to race-related media	.074	.160	.644	.004	25.01	35.61	.486	.010

Note. Cortisol values used in analysis are natural log transformed as demonstrated by prior research. b, *SE*, *p,* and ΔR are used to represent slope, standard error, significance, and measure variability, respectively.

Table E4

Hypothesis 3b.2 Interaction of Daily Predictor and Outcomes as Moderated by Optimism

	Outcomes															
	Cortisol Slope				DHEA Slope				CAR				DAR			
Predictors	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2
Frequent exposure to positive or negative race-related media	-.041	.017	.195	.112	-12.62	4.24	.004	.164	-.422	.362	.281	.028	-19.29	97.53	.840	.001

Note. Cortisol values used in analysis are natural log transformed as demonstrated by prior research. b, *SE*, *p,* and ΔR are used to represent slope, standard error, significance, and measure variability, respectively. Cortisol slope and DHEA slope are rate of diurnal decline in cortisol and DHEA, respectively, and CAR (cortisol awakening response) and DAR (DHEA awakening response) are measurements of morning spike in biomarker activity 30 minutes after waking up

Table E5
Hypothesis 3c.1 Interaction of Baseline Predictor and Outcomes as Moderated by Perceived Control

	Outcomes							
	Baseline Cortisol				Baseline DHEA			
Predictors	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2
Daily frequent exposure to race-related media	.053	.2171	.805	.001	63.34	50.77	.2197	.033

Note. Cortisol values used in analysis are natural log transformed as demonstrated by prior research. b, *SE*, *p,* and ΔR are used to represent slope, standard error, significance, and measure variability, respectively.

Table E6
Hypothesis 3c.2 Interaction of Daily Predictor and Outcomes as Moderated by Perceived Control

	Outcomes															
	Cortisol Slope				DHEA Slope				CAR				DAR			
Predictors	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2
Frequent exposure to positive or negative race-related media	.057	.021	.011	.128	4.46	5.71	.438	.013	.886	.425	.043	.080	-7.51	111.67	.950	.001

Note. Cortisol values used in analysis are natural log transformed as demonstrated by prior research. b, *SE*, *p,* and ΔR are used to represent slope, standard error, significance, and measure variability, respectively. Cortisol slope and DHEA slope are rate of diurnal decline in cortisol and DHEA, respectively, and CAR (cortisol awakening response) and DAR (DHEA awakening response) are measurements of morning spike in biomarker activity 30 minutes after waking up

Table E7

Hypothesis 3d.1 Interaction of Baseline Predictor and Outcomes as Moderated by Ability to Cope with Discrimination

	Outcomes							
	Baseline Cortisol				Baseline DHEA			
Predictors	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2
Daily frequent exposure to race-related media	-.540	.106	.615	.005	19.49	24.03	.422	.014

Note. Cortisol values used in analysis are natural log transformed as demonstrated by prior research. b, *SE*, *p,* and ΔR are used to represent slope, standard error, significance, and measure variability, respectively.

Table E8

Hypothesis 3d.2 Interaction of Daily Predictor and Outcomes as Moderated by Ability to Cope with Discrimination

	Outcomes															
	Cortisol Slope				DHEA Slope				CAR				DAR			
Predictors	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2
Frequent exposure to positive or negative race-related media	.002	.012	.844	.009	-5.09	2.91	.087	.064	-.123	.236	.604	.005	-68.32	62.20	.278	.025

Note. Cortisol values used in analysis are natural log transformed as demonstrated by prior research. b, *SE*, *p,* and ΔR are used to represent slope, standard error, significance, and measure variability, respectively. Cortisol slope and DHEA slope are rate of diurnal decline in cortisol and DHEA, respectively, and CAR (cortisol awakening response) and DAR (DHEA awakening response) are measurements of morning spike in biomarker activity 30 minutes after waking up

Table E9

Hypothesis 3e.1 Interaction of Baseline Predictor and Outcomes as Moderated by Experiences with Discrimination

	Outcomes							
	Baseline Cortisol				Baseline DHEA			
Predictors	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2
Daily frequent exposure to race-related media	-.383	.302	.211	.028	-23.303	70.08	.678	.003

Note. Cortisol values used in analysis are natural log transformed as demonstrated by prior research. b, *SE*, *p,* and ΔR are used to represent slope, standard error, significance, and measure variability, respectively.

Table E10

Hypothesis 3e.2 Interaction of Daily Predictor and Outcomes as Moderated by Experiences with Discrimination

	Outcomes															
	Cortisol Slope				DHEA Slope				CAR				DAR			
Predictors	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2
Frequent exposure to positive or negative race-related media	.038	.033	.264	.028	3.32	8.42	.695	.003	.779	.653	.239	.029	-220.87	173.43	.209	.033

Note. Cortisol values used in analysis are natural log transformed as demonstrated by prior research. b, *SE*, *p,* and ΔR are used to represent slope, standard error, significance, and measure variability, respectively. Cortisol slope and DHEA slope are rate of diurnal decline in cortisol and DHEA, respectively, and CAR (cortisol awakening response) and DAR (DHEA awakening response) are measurements of morning spike in biomarker activity 30 minutes after waking up

Table E11

Hypothesis 3f.1 Interaction of Baseline Predictor and Outcomes as Moderated by Racial Identity

	Outcomes							
	Baseline Cortisol				Baseline DHEA			
Predictors	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2
Daily frequent exposure to race-related media	.097	.225	.667	.003	113.58	48.11	.023	.1046

Note. Cortisol values used in analysis are natural log transformed as demonstrated by prior research. b, *SE*, *p,* and ΔR are used to represent slope, standard error, significance, and measure variability, respectively.

Table E12

Hypothesis 3f.2 Interaction of Daily Predictor and Outcomes as Moderated by Racial Identity

	Outcomes															
	Cortisol Slope				DHEA Slope				CAR				DAR			
Predictors	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2
Exposure to positive or negative race-related media	.023	.027	.396	.015	-6.51	6.87	.348	.091	-.449	.552	.419	.013	-45.26	146.07	.758	.002

Note. Cortisol values used in analysis are natural log transformed as demonstrated by prior research. b, *SE*, *p,* and ΔR are used to represent slope, standard error, significance, and measure variability, respectively. Cortisol slope and DHEA slope are rate of diurnal decline in cortisol and DHEA, respectively, and CAR (cortisol awakening response) and DAR (DHEA awakening response) are measurements of morning spike in biomarker activity 30 minutes after waking up

Table E13

Hypothesis 3g.1 Interaction of Baseline Predictor and Outcomes as Moderated by Race-rejection Sensitivity

	Outcomes							
	Baseline Cortisol				Baseline DHEA			
Predictors	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2
Daily frequent exposure to race-related media	-.105	.141	.459	.010	19.72	32.73	.550	.007

Note. Cortisol values used in analysis are natural log transformed as demonstrated by prior research. b, *SE*, *p,* and ΔR are used to represent slope, standard error, significance, and measure variability, respectively.

Table E14

Hypothesis 3g.2 Interaction of Daily Predictor and Outcomes as Moderated by Race-rejection Sensitivity

	Outcomes															
	Cortisol Slope				DHEA Slope				CAR				DAR			
Predictors	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2
Frequent exposure to positive or negative race-related media	.012	.016	.454	.013	1.42	4.00	.723	.002	-.337	.304	.273	.024	-8.63	81.82	.916	< .001

Note. Cortisol values used in analysis are natural log transformed as demonstrated by prior research. b, *SE*, *p,* and ΔR are used to represent slope, standard error, significance, and measure variability, respectively. Cortisol slope and DHEA slope are rate of diurnal decline in cortisol and DHEA, respectively, and CAR (cortisol awakening response) and DAR (DHEA awakening response) are measurements of morning spike in biomarker activity 30 minutes after waking up

Table E15

Hypothesis 3h.1 Interaction of Baseline Predictor and Outcomes as Moderated by Activism Orientation

	Outcomes							
	Baseline Cortisol				Baseline DHEA			
Predictors	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2
Daily frequent exposure to race-related media	.050	.128	.700	.002	8.12	31.02	.794	.001

Note. Cortisol values used in analysis are natural log transformed as demonstrated by prior research. b, *SE*, *p,* and ΔR are used to represent slope, standard error, significance, and measure variability, respectively.

Table E16

Hypothesis 3h.2 Interaction of Daily Predictor and Outcomes as Moderated by Activism Orientation

	Outcomes															
	Cortisol Slope				DHEA Slope				CAR				DAR			
Predictors	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2	b	*SE*	*p*	ΔR^2
Frequent exposure to positive or negative race-related media	-.018	.014	.202	.036	-6.57	3.41	.061	.073	-.427	.278	.132	.047	-105.04	74.21	.164	.040

Note. Cortisol values used in analysis are natural log transformed as demonstrated by prior research. b, *SE*, *p,* and ΔR are used to represent slope, standard error, significance, and measure variability, respectively. Cortisol slope and DHEA slope are rate of diurnal decline in cortisol and DHEA, respectively, and CAR (cortisol awakening response) and DAR (DHEA awakening response) are measurements of morning spike in biomarker activity 30 minutes after waking up

Appendix F
Summary of Support for Hypotheses

Table F1

Hypothesis 1: Frequent Exposure to Negative Race-Related Media Content Will Predict Dysregulation of Cortisol and DHEA

Biological Timepoints	Hypothesis supported
a. Baseline	Not supported
b. Cortisol and DHEA Slope	Partially supported
c. Cortisol and DHEA Awakening Response	Partially supported

Table F2

Hypothesis 2. Frequent Exposure to Negative Race-Related Media Compared to Positive Race-Related Media will be Positivity Correlated with Biological Outcomes.

Outcomes	Hypothesis supported
a. Baseline cortisol	Not supported
b. Baseline DHEA	Not supported
c. Flatter diurnal cortisol slope	Not supported
d. Flatter diurnal DHEA slope	Not supported
e. Blunted cortisol awakening response	Not supported
f. Blunted DHEA awakening response	Not supported

Table F3
Hypothesis 3. The Relationship Between Frequent Exposure to Positive or Negative Race-Related Media and Biological Markers and will be Moderated by Individual Differences

	Biological Markers					
Moderating Individual Differences	Baseline Cortisol	Baseline DHEA	Cortisol Slope	DHEA Slope	CAR	DAR
a. Trait self-esteem	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
b. Optimism	Not supported	Not supported	Not supported	Supported	Not supported	Not supported
c. Perceived control	Not supported	Not supported	Not supported	Not supported	Supported	Not supported
d. Ability to cope with discrimination	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
e. Race-rejection sensitivity	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
f. Experiences with discrimination	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
g. Racial Identity	Not supported	Supported	Not supported	Not supported	Not supported	Not supported
h. Activism	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported

Note. Cortisol slope and DHEA slope are rate of diurnal decline in cortisol and DHEA, respectively, and CAR (cortisol awakening response) and DAR (DHEA awakening response) are measurements of morning spike in biomarker activity 30 minutes after waking up

Table F4

Hypothesis 4. Frequent Exposure to Negative Race-Related Media Compared to Positive Race-Related Media will be Positivity Correlated with Psychological Outcomes.

Outcomes	Hypothesis supported
a. State self-esteem	Not supported
b. Self-reported stress	Not supported
c. Affect	Supported

Table F5

Hypothesis 5. Baseline Cortisol and DHEA will Mediate the Relationship Between Baseline Frequent Exposure to Negative Race-Related Media Compared to Positive Race-Related Media on Psychological Outcomes.

Outcomes	Baseline Cortisol	Baseline DHEA
a. Self-reported stress	Not supported	Not supported
b. Affect	Not supported	Not supported

Table F6

Hypothesis 6. Diurnal Cortisol and DHEA will Mediate the Relationship Between Frequent Daily Exposure to Negative Race-Related Media Compared to Positive Race-Related Media on Daily Psychological Outcomes

	Mediating Biological Markers			
Outcomes	Cortisol Slope	DHEA Slope	CAR	CAR
State self-esteem	Not supported	Not supported	Not supported	Not supported
Self-reported stress	Not supported	Not supported	Not supported	Not supported
Affect	Not supported	Not supported	Not supported	Not supported

Note. Cortisol slope and DHEA slope are rate of diurnal decline in cortisol and DHEA, respectively, and CAR (cortisol awakening response) and DAR (DHEA awakening response) are measurements of morning spike in biomarker activity 30 minutes after waking up

Table F7
Hypothesis 7. A Moderating Mediation Model Predicting Daily State Self-Esteem

	Mediation Biological Markers					
Moderating Individual Differences	Baseline Cortisol	Baseline DHEA	Cortisol Slope	DHEA Slope	CAR	DAR
Trait self-esteem	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Optimism	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Perceived control	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Ability to cope with discrimination	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Race-rejection sensitivity	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Experiences with discrimination	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Racial Identity	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Activism	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported

Note. Cortisol slope and DHEA slope are rate of diurnal decline in cortisol and DHEA, respectively, and CAR (cortisol awakening response) and DAR (DHEA awakening response) are measurements of morning spike in biomarker activity 30 minutes after waking up

Table F8
Hypothesis 7. A Moderating Mediation Model Predicting Daily Perceived Stress

	Mediation Biological Markers					
Moderating Individual Differences	Baseline Cortisol	Baseline DHEA	Cortisol Slope	DHEA Slope	CAR	DAR
Trait self-esteem	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Optimism	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Perceived control	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Ability to cope with discrimination	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Race-rejection sensitivity	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Experiences with discrimination	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Racial Identity	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Activism	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported

Note. Cortisol slope and DHEA slope are rate of diurnal decline in cortisol and DHEA, respectively, and CAR (cortisol awakening response) and DAR (DHEA awakening response) are measurements of morning spike in biomarker activity 30 minutes after waking up

Table F9
Hypothesis 7. A Moderating Mediation Model Predicting Daily Affect

	Mediation Biological Markers					
Moderating Individual Differences	Baseline Cortisol	Baseline DHEA	Cortisol Slope	DHEA Slope	CAR	DAR
Trait self-esteem	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Optimism	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Perceived control	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Ability to cope with discrimination	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Race-rejection sensitivity	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Experiences with discrimination	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Racial Identity	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported
Activism	Not supported	Not supported	Not supported	Not supported	Not supported	Not supported

Note. Cortisol slope and DHEA slope are rate of diurnal decline in cortisol and DHEA, respectively, and CAR (cortisol awakening response) and DAR (DHEA awakening response) are measurements of morning spike in biomarker activity 30 minutes after waking up

Appendix G
Supplemental Data Analysis

Perceived Racism from Media

In addition to the analyses completed for this study, it was also of interest to investigate the relationship between participants' daily perceived racism from media and diurnal cortisol and DHEA levels. However, only a portion of the study participants completed this daily measure ($N = 21$, 14.8% of the total, 37.5% of the baseline Part two lab sample, and 42.8% of Part Three sample) No results with this predictor were found to be significant, possible due to small sample size. First, to test the main effects of daily perceived racism from media on cortisol and DHEA slopes, linear regressions were used. Results showed no significant main effects for cortisol slope, $F(1, 19) = .041$, $p = .841$, $R^2 = .002$, or DHEA slope, $F(1, 19) = .595$, $p = .450$, $R^2 = .030$. Next, to test the main effects of daily perceived racism from media on the cortisol and DHEA awakening responses linear regressions were also used. Results indicated no significant main effects for the cortisol awakening response, $F(1, 19) = .171$, $p = .684$, $R^2 = .009$, or the DHEA awakening response, $F(1, 19) = .005$, $p = .716$, $R^2 = .000$. These results suggest that perceived racism from media does not correlate with the diurnal rhythms of cortisol and DHEA.

Similar to the study's hypotheses testing, the moderating effect of individual differences on the relationship between perceived racism from media and biomarkers were of interest. First, trait self-esteem was tested. Results indicated no significant interactions between daily racism from media and trait self-esteem on cortisol slope, $F(5, 15) = .153$, $p = .975$, $b =$ -

.04, p = .804, ΔR^2 = .004, DHEA slope, F(5, 15) = 1.04, p = .426, b = 42.75, p = .426, ΔR^2 = .127, the cortisol awakening response, F(5, 15) = .1.07, p = .413, b = -.964, p = .752, ΔR^2 = .005, or the DHEA awakening response, F(5, 15) = .417, p = .829, b = -250.84, p = .689, ΔR^2 = .009.

Regression analyses were used to test the interaction between daily racism from media and optimism on cortisol slope, DHEA slope, the cortisol awakening response, and the DHEA awakening response. No significant interactions were found for cortisol slope, F(5, 15) = .199, p = .957, b = -.048, DHEA slope, F(5, 15) = 1.52, p = .241, the cortisol awakening response, F(5, 15) = .623, p = .684, or the DHEA awakening response, F(5, 15) = .578, p = .716. Therefore, optimism was not supported as a moderating individual difference of this relationship. The individual difference variable perceived control was also analyzed as a moderating individual difference variable. Regression analyses were used to test the two-way interaction between daily racism from media and perceived control on biological markers. Analyses were not significant for cortisol slope, F(5, 15) = .251, p = .932, DHEA slope, F(5, 15) = .357, p = .869, the cortisol awakening response, F(5, 15) = .746, p = .60, or the DHEA awakening response, F(5, 15) = 1.19, p = .356, thus, these results suggest that perceived control does not effect the relationship between daily racism from media and diurnal biomarkers.

Ability to cope with discrimination was also of interest as a protective individual difference variable. Again, regression analyses were used to test the interaction between daily racism from media and ability to cope with discrimination on biomarkers. Findings were not significant for cortisol slope, F(5, 15) = .295, p = .906, DHEA slope, F(5, 15) = .372, p = .859,

the cortisol awakening response, $F(5, 15) = .477$, $p = .787$, or the DHEA awakening response, $F(5, 15) = .463$, $p = .797$. These results suggest that ability to cope with discrimination does not moderate the relationship between daily racism from media and diurnal biomarkers.

Next, past experiences with discrimination tested. Regression was used to test the moderating effects of experiences with discrimination on the relationship between perceived racism from media and cortisol and DHEA. Results yield no significant interactions between perceived racism from media and experiences with discrimination on cortisol slope, $F(5, 15) = .501$, $p = .771$, DHEA slope, $F(5, 15) = .718$, $p = .619$, the cortisol awakening response, $F(5, 15) = .428$, $p = .821$, or the DHEA awakening response, $F(5, 15) = .424$, $p = .824$. Therefore, past experiences with discrimination may not affect the relationship between racism from media and diurnal cortisol and DHEA. Racial identity was tested as a moderator of the relationship between racism form media and cortisol and DEHA levels. Regression analyses yielded a no significant interactions between daily racism from media and racial identity on cortisol slope, $F(5,15) = .211$, $p = .952$, DHEA slope, $F(5,15) = .652$, $p = .664$, the cortisol awakening response, $F(5,15) = .692$, $p = .637$, or the DHEA awakening response, $F(5,15) = .481$, $p = .784$. These results suggest that racial identify does not moderate the effect of racism from media on diurnal cortisol and DHEA levels.

Another race-related individual difference that was tested was race-rejection sensitivity. Regression analyses showed a no significant interactions between daily racism from media and race-rejection sensitivity on cortisol slope, $F(5,15) = .229$, $p =$

.943, DHEA slope, $F(5,15) = .517$, $p = .759$, the cortisol awakening response, $F(5,15) = .567$, $p = .724$, or the DHEA awakening response, $F(5,15) = .368$, $p = .862$. Therefore, based on these results, race-rejection sensitivity does not moderate the relationship between perceived racism from media and diurnal biomarkers.

Final analyses tested the individual difference variable of activism. Regression analyses found no significant interaction between daily racism from media and activism on cortisol slope, $F(5,15) = .577$, $p = .716$, DHEA slope, $F(5,15) = .453$, $p = .804$, the cortisol awakening response, $F(5,15) = .428$, $p = .822$, or the DHEA awakening response, $F(5,15) = .694$, $p = .636$. Overall, results indicated that none of the tested individual differences significantly moderated the relationship between daily racism from media and biological markers.

Next, analyses investigated the correlation of daily racism from media on psychological outcomes (e.g., self-reported stress, state self-esteem, and daily positive affect). Linear regressions were used to test the main effect of daily racism from media on self-reported stress, state self-esteem, and affect. Results showed no significant main effects for self-reported stress, $F(1, 19) = .83$, $p = .373$, $R^2 = .205$, state self-esteem, $F(1, 19) = .666$, $p = .425$, $R^2 = .184$, or daily affect, $F(1, 19) = .110$, $p = .744$, $R^2 = .076$. This suggest that daily racism from media does not correlate with tested daily psychological outcomes.

Finally, the relationship between daily racism form media and psychological outcomes (e.g., self-reported stress, state self-esteem, and affect) as mediated by daily biological factors (e.g., cortisol and DHEA slopes and the awakening responses) were tested. Confidence intervals of mediation indirect effects were computed using 1,000 bootstrapped sampled for each

analysis. If bootstrapped confidence intervals for the indirect effect estimates did not contain zero, then the mediation model was interpreted as significant.

Results indicated that the direct effect from daily racism from media to the cortisol awaking response (path a) was not significant, $F(3, 17) = .788$, $p = .511$, $R^2 = .123$, $b = .712$ $p = .380$. The direct effect from the cortisol awakening response to daily stress (path b) was no significant, $F(4, 16) = .2305$, $p = .917$, $R^2 = .054$, $b = -.059$, $p = .675$) The direct effect from daily racism from media to daily stress (path c) was not significant ($b = .414$, $p = .386$) and the indirect effect was also not significant ($b = -.042$, 95% CI [.462, .489]). Next, it was found that the direct effect from daily racism from media to the DHEA awaking response (path a) yield not significant results, $F(3, 17) = .690$, $p = .570$, $R^2 = .108$, $b = .52.18$ $p = .806$. The direct effect from the DHEA awakening response to daily stress (path b) was not significant $F(4, 16) = .266$, $p = .895$, $R^2 = .062$, $b = -.001$, $p = .579$. The direct effect from daily racism from media to daily stress (path c) was not significant ($b = .387$, $p = .405$) and the indirect effect was also was not significant ($b = -.015$, 95% CI [-.359, .345]).

The relationship between daily racism from media and the cortisol awakening response was analyzed. The direct effect from daily racism from media to the cortisol awaking response (path a) was found to be not significant, $F(3, 17) = .788$, $p = .511$, $R^2 = .123$, $b = .712$ $p = .380$, and the direct effect from the cortisol awakening response to daily self-esteem (path b) was also not significant, $F(4, 16) = .230$, $p = .917$, $R^2 = .054$, $b = -.039$, $p = .804$. The direct effect from daily racism from media to daily self-esteem (path c) yield not significant results, ($b = -.432$, $p = .424$) and the indirect effect was also not significant ($b =$

-.028, 95% CI [-.382, .360]). Also, there results yield no significant findings for the DHEA awakening response. The direct path from daily racism from media to the DHEA awaking response (path a) was not significant, $F(3, 17) = .690$, $p = .570$, $R^2 = .108$, $b = .52.18$ $p = .806$. The direct effect from the DHEA awakening response to daily self-esteem (path b) was not significant, $F(4, 16) = .216$, $p = .925$, $R^2 = .051$, $b = .001$, $p = .925$. The direct effect from daily racism from media to daily stress (path c) was no significant ($b = -.463$, $p = .383$). The indirect effect was also not significant ($b = .003$, 95% CI [-.384, .409]).

Mediational analyses tested the mediating effects of the cortisol awakenings response and the DHEA awakening response on the relationship between daily racism form media and psychological outcomes. Results yield that the direct effect from daily racism from media to the cortisol awaking response (path a) was not significant, $F(3, 17) = .788$, $p = .511$, $R^2 = .123$, $b = .712$ $p = .380$. The direct effect from the cortisol awakening response to daily affect (path b) was not significant, $F(4, 16) = .196$, $p = .936$, $R^2 = .046$, $b = -.067$, $p = .658$. The direct effect from daily racism from media to daily affect (path c) was not significant ($b = .195$, $p = .699$) and the indirect effect was also not significant ($b = -.047$, 95% CI [-.474, .410]). Next, the DHEA awakening response was tested. The direct effect from daily racism from media to the DHEA awaking response (path a) was not significant, $F(3, 17) = .690$, $p = .570$, $R^2 = .108$, $b = .52.18$ $p = .806$. The direct effect from the DHEA awakening response to daily affect (path b) was not significant, $F(4, 16) = .539$, $p = .708$, $R^2 = .118$, $b = -.001$, $p = .234$. The direct effect from daily racism from media to daily affect (path c) was not significant ($b = .182$, $p = .701$) and the indirect effect was also

not significant (b = -.034, 95% CI [-.488, .660]). Therefore, these results suggest that the awakenings responses do not mediate the relationship between daily racism from media and self-reported psychological outcomes.

Finally, the diurnal slopes were tested as mediators of the relationship between racism from media and psychological outcomes (e.g., self-reported stress, state self-esteem, and daily positive affect). First, the direct effect from daily racism from media to cortisol slope (path a) was found to be not significant, $F(3, 17) = .159$, $p = .922$, $R^2 = .027$, $b = .007$, $p = .181$. The direct effect from cortisol slope to daily stress (path b) was not significant, $F(4, 16) = .183$, $p = .943$, $R^2 = .043$, $b = -.058$, $p = .983$, and the direct effect from daily racism from media to daily stress (path c) was also not significant (b = .372, p = .427). Further, the indirect effect was also not significant (b = -001, 95% CI [-.562, .451]). Results yield no significant findings for cortisol diurnal slope on daily self-reported stress. Analyses on DHEA diurnal slope was also tested. The direct effect from daily racism from media to DHEA slope (path a) yield not significant results, $F(3, 17) = .595$, $p = .626$, $R^2 = .095$, $b = -2.434$, $p = .736$. The direct effect from DHEA to daily stress (path b) was not significant, $F(4, 16) = .195$, $p = .937$, $R^2 = .046$, $b = -.003$, $p = .838$. The direct effect from daily racism from media to daily stress (path c) was not significant (b = .363, p = .794) and the indicted effect was also not significant (b = -008, 95% CI [-.549, .412]).

Next, analyses tested the mediation model on the outcome of state self-esteem and yield no significant results. The direct effect from daily racism from media to cortisol slope (path a) was not significant, $F(3, 17) = .159$, $p = .922$, $R^2 = .027$, $b = .007$, $p = .181$. The direct effect from cortisol slope to daily self-esteem (path b) was not significant, $F(4, 16) = .290$, $p = .879$,

R^2 =.067, b = -1.71, p = .596. The direct effect from daily racism from media to daily self-esteem (path c) was not significant (b = -.448, p = .394) and the indirect effect not significant (b = -012, 95% CI [-.463, .623]). Results yield no significant findings for cortisol diurnal slope on state self-esteem. DHEA slope was tested as a mediator of the stated relationship. The direct effect from daily racism from media to DHEA slope (path a) was found to not be significant, F(3, 17) = .595, p =.626, R^2 =.095, b = -2.434, p = .736, The direct effect from cortisol DHEA to daily self-esteem (path b) was not significant (F(4, 16) = .218, p =.924, R^2 =.051, b = -.002, p = .902. The direct effect from daily racism from media to daily self-esteem (path c) was not significant (b = -.465, p = .391) and the indirect effect was also found to be not significant (b = .005, 95% CI [-.637, .404]).

Finally, the psychological outcome of daily affect (mood) was tested in the stated mediation model. First, cortisol slope was analyzed as the mediator between daily racism from media and daily positive affect. The direct effect from daily racism from media to cortisol slope (path a) was not significant, F(3, 17) = .159, p =.922, R^2 =.027, b = .007, p = .181. The direct effect from cortisol slope to daily mood (path b) was not significant, F(4, 16) = .171, p =.950, R^2 =.041, b = .984, p = .748. The direct effect from daily racism from media to daily mood (path c) was not significant (b = .140, p = 776) and the indirect effect was also not significant (b = .007, 95% CI [-.547, .544]). Analyses concluded no mediation effect for cortisol slope.

Mediational analysis tested the effect of DHEA on the relationship between daily racism from media and positive affect. The direct effect from daily racism from media to DHEA slope (path a) was found to be not significant, F(3, 17) = .595, p =.626, R^2 =.095, b = -2.434, p = .736. The direct effect from cortisol DHEA to daily mood (path b) was not significant, F(4,

16) = .195, p =.937, R^2 =.046, b = .007, p = .659. The direct effect from daily racism from media to daily mood (path c) was not significant (b = .166, p = .738) and finally, the indirect effect was not significant (b = -018, 95% CI [-.459, .679]). Overall, the analyses testing the predictor variable of daily racism from media yield no significant results. The results suggest that perceived racism from media may not play a role in physiological and psychological outcomes; however, this conclusion is premature and contradicts prior literature. The results are inconclusive due to a very small sample size. Future research should expand on the predictor variable to try and understand the relationship perceived racism may have on health outcome of young Black adults.