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RACE AND RISK: THE INFLUENCE OF RACIAL STRESS ON INTERNALIZING SYMPTOMS  
AND HEALTH BEHAVIORS AMONG COLLEGE-AGED BLACK WOMEN (147 pp.)

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For racial and ethnic minorities, encounters with racism are inevitable, frequent, and present from birth until death. Black women frequently report intense racism experiences in recreational, educational, professional, and medical settings that, for some, are violent and life-threatening. Such experiences often invoke racial stress, which is emotional distress brought on by racial discrimination or racially focused encounters. Research documents that racism and related racial stress are physically and psychologically impairing. Specific associations noted in the literature include anxiety, depression, heart-related conditions, and disease activity. Recent methodological trends have shifted the focus from examining racism to racial stress, given the high frequency of racism experiences. In the existent racial stress literature, few studies investigate its influence on health behaviors. Therefore, our study aims to quantitatively investigate racial stress and its influence on internalizing symptoms and health behaviors in a sample of college-age Black women. Additionally, we aim to explore the intervening influence of racial factors, including racial and ethnic identity, skin tone, and hair texture. Our findings emphasize that racism, along with racial stress, is prevalent among college-aged Black women. We also highlight connections between racial stress and internalizing symptoms, limited physical activity, and marijuana use. Additionally, effects of moderation of skin tone on internalizing symptoms and hair texture on the number of sexual partners were revealed. Clinical implications discussed the larger impact of

our findings and highlighted the need to incorporate racial stress assessments in clinical diagnostic evaluations. Directions for future research studies are noted.

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A dissertation submitted  
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## **Introduction**

The construct of racial stress has garnered significant media attention and literature recognition in recent decades (Anderson & Stevenson, 2019; Hope et al., 2020). The term describes emotional distress experienced by racial and ethnic minorities following racial discrimination or racially focused encounters (Harrell, 2000; Anderson et al., 2019). For minorities, these encounters are unavoidable, recurrent, and present from birth until death (Beatty Moody et al., 2019; Ong et al., 2009). Black women frequently report intense racism experiences in recreational, educational, professional, and medical settings that for some are violent and life-threatening (Hassen et al., 2021; Johnson et al., 2022; Martz et al., 2019). Racial stress following such experiences may be marked by immediate physiological symptoms, including increased heart rate, breath, perspiration, muscle tension, and blood pressure (Berger & Sarnyai, 2015; Brody et al. 2008; Hargons et al., 2021). Prolonged experiences of racial stress have been associated with more severe outcomes, including cardiovascular disease, stroke, diabetes, hypertension, and feelings of hopelessness, despair, worthlessness, anhedonia, and anxiety (Walker et a 2014; Chao & Green, 2011; Coleman & Stevenson, 2013; Davis et al., 2005; Din-Dzietham et al., 2004, Lee et al., 2016; Johnson-Jennings et al., 2014). Consequently, the literature categorizes racial stress as a physically and psychologically impairing chronic stressor (Franklin, 2016; Kirkinis et al., 2021; Saleem et al., 2021). Furthermore, nascent research suggests that racial stress may be a better predictor of health than the occurrence of racism experiences due to the latter's high prevalence (Anderson et al., 2019; Franklin-Jackson,

& Carter, 2007; DeLapp & DeLapp, 2021; Griffin & Armstead, 2020). Additional study is warranted.

## **Race & Racism**

To fully understand racial stress and its impact, one must first understand race and racism. Race is a social construct that categorizes people based on phenotypes (i.e., identifiable physical characteristics), such as nose length and width, eye shape, lip size, skin tone, hair texture, and physique (Johnson et al., 2013; Johnson, et al., 2012). Racial classifications first emerged in the 16th century (Billinger, 2007). Later, they were utilized in the 18th century to assert that specific racial groups represented specific qualities, such as, cognitive, academic, and emotional intelligence, as well as physical strength, and endurance (Zakharov, 2015). Ultimately, this created a hierarchical ranking of racial groups, creating bias and prejudices and promoting racism (Duggan et al., 2020). Racism is "a system of structuring opportunity and assigning value... based on race" that favors White individuals over racial and ethnic minorities (Jones, 2018, p231).

## **Levels of Racism**

Four levels of racism consistently appear in the current literature and explain its wide range of influence on systems and individuals (Jones, 2018; Jones, 2000). The first level is structural racism, rooted in the foundation of modern multi-ethnic societies, given their colonial beginnings. Structural racism describes racial discrimination across multiple institutions and industries such as government, policy, laws, finance, education, religion, health care, and media (Gee & Ford, 2011). As designed, its interconnecting systems restrict power and opportunities to

White individuals and limit access to people of color. This restriction hampers racial and ethnic minorities from advancing in society, minimizing their influence (Lawrence, & Keleher, 2004).

The second level is institutional racism. This characterizes racial discrimination embedded within the design of institutions and industries, for example, schools, universities, banks, and corporations (Elias & Paradies, 2021). Institutional racism contributes to racial minorities' difficulties in becoming aware of and capitalizing on opportunities to advance their socioeconomic status, such as through obtaining employment positions, board or committee positions, and promotions. This further limits their power by reducing their opportunity for wealth (Miller & Garran, 2007; Patel, 2021; Griffith et al., 2007).

The third level is personally mediated or interpersonal racism. This describes discriminatory racism experiences perpetuated by one individual to another (Jones, 2018). This is commonly displayed via macroaggressions (e.g., racial slurs) or microaggressions (e.g., racially-centered nonverbal or negative verbal messages) (Compton-Lilly, 2020; To et al., 2020). This level of racism often harms or complicates professional, familial, romantic, and platonic relationships (Lott & Maluso, 1995; Kornienko et al., 2022).

The fourth and final level is internalized or individual racism. This describes minorities disliking or hating attributes associated with their own racial or ethnic identity due to socialization – the societal shaping of values and attitudes (Bynum et al., 2007; Jones, 2018). The frustration experienced from encountering structural, institutional, and interpersonal racism ultimately gets directed inward and can manifest as self-hatred (Speight, 2007; Sosoo et al., 2020). Minorities who exhibit internalized or individual racism will often display negative self-talk, harshly criticizing stereotypical racially identifying features, including skin tone, hair texture, physique, language, or social position (Hipolito-Delgado, 2010, Volpe et al., 2021). This

is often reflected in their low self-esteem and lack of confidence in their racial or ethnic identity (Cénat et al., 2022; Roberson & Pieterse, 2021). These minorities are also more likely to engage in harmful conversations with others of the same race, participating in interpersonal racism. All four levels of racism mentioned above permeate modern-day multi-ethnic societies, making encounters with racism a common experience for racial and ethnic minorities (Poteat, & Spanierman, 2012; Morrison & Kiss, 2017; Yearby et al., 2022).

## **Racism Experiences**

Racism experiences occur directly or vicariously (Daniels et al., 2020; Heard-Garris et al., 2018). The former describes firsthand experiences of racism. The latter explains second-hand experiences, in which an individual witnesses or learns about others' encounters with racial discrimination (Harrell, 2000; Heard-Garris et al., 2018; Martz et al., 2017). Evidence shows that minorities are vicariously experiencing more racism than in previous decades due to technological advancements (Mason et al., 2017; Volpe et al., 2021). With the accessibility of social media and streaming services, violent racist experiences are widely broadcasted for viewers' discretion. For example, the unjust and racially charged killings of Breonna Taylor and George Floyd circulated on prime-time news and social media platforms such as TikTok, Facebook, Instagram, and Twitter (Hoofnagle et al., 2020; Kwaning, 2020). The accessible and sometimes unavoidable nature of these encounters of vicarious racism likely has a tumultuous impact on racial and ethnic minorities (De Choudhury et al., 2016; Laurencin & Walker, 2020; Williams et al., 2022).

## **Prevalence of Racism**

### ***Among Black Individuals***

Of all minorities, Black individuals report the most frequent and greater lifetime experiences of racism (Charles, 2011; Iyengar et al., 2011; Krogstad & Lopez, 2018; Mathews & Johnson, 2015). A recent study found that on average Black teens reported having five encounters of racial discrimination daily (English et al., 2020). Evidence suggests that similar frequencies with racism occur among young and middle-age Black adults (Lloyd, C. 2020). A possible explanation for the high frequency of racial discrimination among Black individuals is that anti-Black racism is connected to biases and prejudices that accompanied colonization and slavery (Cote-Meek, 2020). Additionally, although slavery was abolished, racial prejudices that persisted during that era still exist in the present-day (Feagin, 2004). For example, Black individuals report experiencing of anti-Black prejudices from racial and ethnic majority and minority groups (Curtis, 2021).

### ***Black Women***

Furthermore, Black individuals who are part of other marginalized groups (e.g., gender, sexual orientation, or ability) also experience racism (Ghabrial, 2017; Sutter & Perrin, 2016; Van Den Bergh & Crisp, 2004). For example, Black minorities who identify as female often experience two forms of discrimination simultaneously due to intersectionality (Fattoracci, Revels-Macalinao, & Huynh, 2020; Leachman, 2016). Their intersecting identities, being Black and female, often intensifies their discriminatory experiences. One researcher referred to the discrimination experienced by Black women as a “double burden” (St Jean & Feagin, 2015). Similarly, multiple studies describe Black women’s discriminatory experiences as complex, stressful, and traumatic (Johnson et al., 2022; Jones et al., 2021; Lewis et al., 2017). Research also suggests that intersectionality makes it difficult to isolate discriminatory experiences. For example, studies suggest that Black women do not identify their discriminatory experience being

due to solely racism or sexism often. Instead, they consistently report that their discriminatory experiences are due to their unique identity as “Black women” (Lewis et al., 2017; Moradi & Subich, 2003; Thomas et al., 2008).

For this paper, the literature review will examine studies that directly investigated racism and racial stress as opposed to other discriminatory experiences of Black women. Given previous research, it is recognized that studies noted in the review also likely capture aspects of sexism and related stress, in addition to racism- as they are undeniably part of Black women’s experiences.

### ***Black Women Experience Racism Across their Lifetime***

Racism occurs at all stages of life for Black women (Brondolo et al., 2009; Hilmert et al., 2014). For example, research indicates that both Black newborns and their mothers endure racism, as they are more likely to receive care from lower-quality and under-resourced hospitals that have high patient-to-nurse ratios. They are also more likely to be offered limited breastfeeding education and support during pregnancy, postpartum, and recovery in their communities (Gaskin et al., 2011; Glazer et al., 2021, Sigurdson et al., 2019). Similar racial disparities in care occur across pediatric, cancer, and cardiovascular health care settings at all ages (Chabner, 2020; Lewey & Choudhry, 2014, Trent et al., 2019).

Past infancy, racism also exists in preschools. Preschool teachers discipline Black and Latino youth more harshly and use substantially different educational methods and approaches (Gordon et al., 2000; Farkas, 2003). This can be attributed to racial bias as evidence suggests that there is likely no significant difference in the behavior of toddlers of different races (Davis et al., 2021; Morgan et al., 2013). Black school-aged children also endure harsher discipline than White children throughout their primary and secondary education. For example, Black adolescent girls are more likely than their White counterparts to face school suspension, expulsion, and school-



based arrests (Gordon et al., 2000). Another study that utilized a sample of Black middle school-aged girls found that racially stereotyped images of Black women negatively influence their appraisals of Black women (Jean et al., 2022).

College-aged Black students report frequent experiences of racism on college campuses from peers and professors (Harper, 2015; Pérez Huber, 2010; Lopez, 2005). Some Black students deliberately choose to attend minority-serving institutions (MSI) or Historically Black-Colleges and Universities (HBCUs) as opposed to predominantly White Institutions (PWIS) (Cooper & Dougherty, 2015; Palmer et al., 2010) to reduce their experiences with racism. Others join Black sororities, seeking social support and solace on predominately White campuses (Bartman, 2015; Espinosa et al., 2017).

In adulthood, workplace racial discrimination is widespread for Black women. One study found that Black women, who work in predominately White settings, reported that they experience the most racism at work (Hughes & Dodge, 1997). Black women also experience racism that affects their dating, travel, and leisure behavioral patterns (Chae et al., 2015; League et al., 2020; Raley et al., 2015). Additionally, racism influences Black women's ability to accrue wealth. Studies indicate that many Black women struggle financially with significant student loan debt and wage gaps that exist between their White and male counterparts (Douglas-Gabriel & Harden, 2021; Pettit, & Ewert, 2009).

Furthermore, research indicates that Black homeowners receive lower home value appraisals, limiting their equity (An et al., 2019; Myers, 2004). When parenting, Black mothers endure racist interactions with teachers, coaches, and nurses (Chapman & Bhopal, 2013). It also shapes their parenting practices with their children (Bécares et al., 2015; Pachter & Coll, 2009) and what they allow their children to do and not do. For example, one study found that Black

mothers expressed concerns about their children's attire and them playing outside in fear of receiving racial mistreatment (Somerville et al., 2021). The same study found that other Black mothers noted that racism and poverty-related issues make them question having children (Somerville et al., 2021). Racism also affects people's inability to access health care in old age. Evidence shows that minority seniors work more and retire later in life than White individuals (Bleich et al., 2019).

## **Consequences of Racism for Black Women**

### ***Stereotypes***

One consequence of racism is the emergence of harmful stereotypes of Black women (Abrams & Maxwell, 2019). This paper briefly explains four commonly known stereotypes. The first, Strong Black Women (SBW) stereotype, posits that Black Women possess a heroic-like strength to manage and survive their life as a double minority. This stereotype attempts to recognize the historical resiliency of Black women. However, the stereotypical SBW frequently and dangerously overexerts her energy and resources by modern standards (Godbolt & Amutah-Onukagha, 2022). Specific behaviors that categorize SBW include working long hours or multiple jobs, juggling heavy courseloads, managing microaggressions in the workplace, and being a single mother (Abrams & Maxwell, 2019).

The following three stereotypes, often clustered together, are various images of Black women that were portrayed in the media during and after slavery; however, they still exist today. The Mammy stereotype depicts an image of a Black woman as an overweight maternalistic caregiver. The Mammy devotes her life to serving others (e.g., her master and others' children) (Rosenthal & Lobel, 2016). The Jezebel stereotype is characterized as a promiscuous young

Black woman who has no morals, flaunts her sexuality, and entices men. Historically, this stereotype served as a scapegoat to place blame on young Black girls when they became impregnated by White adult men (Thorpe, et al., 2022). Lastly, the Sapphire stereotype depicts an angry, loud, and opinionated Black woman. This stereotype sharply contrasts with Western ideals of White femininity that are synonymous with softness and gracefulness. Given this, vocal Black women who discussed their harsh reality and verbalized related emotions are socially viewed as being undesirable, unladylike, and problematic (Jerald et al., 2017). Altogether, these stereotypes serve as racist instruments to defame and oppress Black women.

## **Physical Health**

Cumulative experiences with racism naturally take a physical and psychological toll on Black women. Physical consequences of racism vary in severity from acute to fatal. More frequent experiences of racism were linked to poorer overall physical health (Kwate et al., 2003) and increased sick days and doctor visits (Larson et al., 2007). Regarding labor and delivery, racism was associated with low birth weight, preterm birth and stillbirth, and other poor birth outcomes like preeclampsia for Black women (Beck et al., 2020; Hilmert et al., 2014; Mendez et al., 2014; Vilda et al., 2021). Racism experiences were also related to high bronchodilators (BDR), indicative of respiratory inflammation, for Black youth with asthma. Adult-onset asthma was associated with cumulative life experiences of job, housing, and police-related racism for Black women (Coogan et al., 2014). Another study found that racism experienced at work was linked to high blood pressure and hypertension risk for Black women (Cozier et al., 2006). Similar associations were found among Black students who endured more frequent racism at their colleges and universities (Clark, 2004; Jankowski, 2022).

Multiple study findings revealed relationships between discriminatory racial encounters and heart-related problems, cardiovascular disease, and respiratory and pain conditions among various racial minorities (Jackson et al., 2013; Djuric et al., 2010; Geronimus, 2010; Dolezsar, et al., 2014). Furthermore, studies assert that racism significantly contributes to racial health disparities in mortality for Black infants, children, and women (Howell, 2008; Nelson, 2016). In addition to general mortality, studies suggest that racism is a major contributor to racial disparities in the death rates of Black women with heart diseases, stroke, cancer, asthma, influenza, pneumonia, diabetes, HIV/AIDS, and individuals who die by homicide (Harris et al., 2012; Martin et al., 2021; Robinson et al., 2022; Lillie-Blanton et al., 1996; Zavala et al., 2021).

Racism is also linked to engagement in poor and risky health behaviors. For example, racial discrimination was associated with not having up-to-date health screenings or appointments, poor adherence to medication plans, difficulties sleeping, and being overweight smoking, and binge drinking (Cozier et al., 2009; Garcini et al., 2018; Vines et al., 2007). These identified behaviors likely increased the risk for the conditions and disease activity noted above. Furthermore, the literature also underscores that racism limits access to health education and financial resources related to health care (Tan et al., 2022).

## **Mental Health**

Racism's psychological toll on Black women is also well-documented. Studies highlight that Black women, who experience racist encounters, frequently endorse subsequent unpleasant emotions, including anger, embarrassment, hopelessness, and sadness (Johnson et al., 2022; Quist et al., 2022). Other studies underscore racism's associations with internalizing and externalizing symptoms. For example, studies found that there were associations between racism experiences with distress (Pieterse et al., 2012) and poorer well-being among Black and Hispanic

youth (Kwate & Goodman, 2015) and Black Americans (Jackson et al., 1996). Among Black youth, racial discrimination was associated with depressive symptoms. Furthermore, multi-ethnic studies report that minorities who experienced racism later endorsed post-traumatic symptoms, including anxiety, guilt or shame, and hypervigilance (Kirkinis et al., 2021).

Among Black youth who had experiences with juvenile incarnation, more frequent encounters of racial discrimination were associated with more post-traumatic stress and delinquent behaviors (Kang & Burton, 2014). A multi-ethnic youth study of White, Latinx, Biracial/Multiracial, Black, Native American, Pacific Islander/Native Hawaiian, and Asian participants reported associations between racism and posttraumatic-stress symptoms when controlling for other trauma exposures (Mendez et al., 2020). A separate multi-ethnic study of Black, Latinx, Asian, American Indian, and Biracial participants yielded similar results. They found that direct racism experiences were linked to the endorsement of trauma symptoms, for example, anxiety, guilt or shame, and hypervigilance (Kirkinis et al., 2021).

In summary, racism and racial discrimination are inevitable facets of the Black experience. These adverse experiences are linked to a plethora of health consequences, threatening Black women's mental and physical well-being. In recent decades, racism researchers have gone beyond explorations of the endorsement of racism experiences and investigated perceived racial stress following such experiences (Curtis et al., 2023; Li & Lin, 2022). The extant racial stress literature is developing and promising. The review of racial stress studies noted below includes some co-ed samples of Black adults and samples of multi-ethnic studies that include Black females, as studies that utilized only Black female samples are limited.

## **Racial Stress Review**

### ***Construct***

Racial stress can be viewed as an immediate or distal emotional consequence of racism. Harrell's Multidimensional Conceptualization of Racial Stress Model (Harrell, 2000) explores the various opportunities to receive damage from experiencing racism: the event itself, the victim's emotional response, and others' perception of the event. For example, if witnesses respond poorly, such as invalidating a victim's experience via ignoring the event or blaming the victim, this magnifies the potential harm. Consequently, this creates additive stressful experiences distinctively separate from the racist event.

According to Harrell's model, two key factors contribute to one's racial stress experience, specifically personal factors (e.g., race, ethnicity, gender, age, language, physical attributes) and socio-environmental factors (e.g., current socio-political context, regional or geographic location, SES, and racial composition contexts). Furthermore, related coping mechanisms are shaped by an individual's familial and socialization influences. Collectively, these factors contribute to the presence and severity of an individual's racial stress (Harrell, 2000). Harrell's model also discusses natural consequences that naturally emerge from experiencing racial stress, including poor physical, psychological, social, functional, and spiritual outcomes. Other studies investigating racial stress rely heavily on the popular Transactional Model of Stress and Coping by Lazarus & Folkman (1987). This model incorporates two forms of appraisal: an individual's threats and coping efforts. However, a significant limitation of this model is that it does not directly consider any cultural components.

### **Prevalence of Racial Stress among Black Women**

The racial stress literature is steadily growing. As of 2021, more than 66 empirical quantitative studies have investigated the construct racial stress. Most of those studies were published in the last two decades. More than half were published within the last eight years.

(Somerville, 2021). Additionally, an overwhelming majority of studies utilized cross-sectional designs, while some employed longitudinal, combined cross-sectional, and longitudinal or experimental designs. Most racial stress studies were conducted in the United States. Regarding geographical regions, most racial stress studies were conducted in the South, followed by the North.

Most published racial stress studies utilized samples of Black adults, consistent with the high prevalence of racial discrimination among Black individuals (Feagin & Sikes, 1994; Uda, 2017). Furthermore, most racial stress studies on Black individuals were conducted on Black women. Black women endorsed experiencing racial stress at their job (Hall et al., 2012) and felt uncomfortable using a sick day when needed (Merecz & Andysz, 2014; Muhammad, 2011). College Black women experienced racial stress from using social media and navigating racist stereotypes on their campuses (Anderson, 2018). Furthermore, evidence shows that racial stress decreases career aspiration among Black college students (Tovar et al., 2012). Coleman & Stevenson (2013) reported that Black and other racial minority professors at predominately White institutions (PWIs) also experienced racial stress. Similar findings were present in childhood and adolescence documenting reported racial stress experienced by students in kindergarten from twelfth-grade educators (Tinsley, 2018).

## **Consequences of Racial Stress among Black Women**

### ***Physical Health***

Racial stress, like racism, follows a similar health paradigm. A multi-ethnic sample of adults found a relationship between high levels of racial stress and sympathetic nervous system (SNS) arousal, an indicator of physiological stress activity (Geronimus et al., 2013). Other

studies highlighted relationships between endorsed racial stress and minor ailments (e.g., headaches) and chronic health conditions (migraine, asthma, allergies, high blood pressure) among Black adults (Brody et al. 2008). High levels of racial stress were associated with diastolic blood pressure in a co-ed sample of Black adults (Lee et al., 2016). Among Black female adults, associations between experiences of racial stress and Lupus disease activity were found (Williams et al., 2018).

Some studies showcased the relation between endorsed racial stress and several health behaviors, including emotional eating (Pittman et al., 2017), alcohol use, coping-motivated drinking (Pittman et al., 2019), and the number of sexual partners (Stevens-Watkins et al., 2011), and treatment interference (Greer, 2016) in co-ed Black samples. However, other studies found conflicting findings. For example, no associations were found between endorsed racial stress and adherence to hypertension treatment (Greer et al., 2014), binge drinking (Metzger et al., 2019), or perceived health (Carter & Walker, 2014) among Black adults. In Black female samples, relationships were present with high levels of racial stress and alcohol use (Pittman & Kaur, 2018) and poor eating habits (Salami et al., 2019).

### ***Mental Health***

Multiple studies document relationships between racial stress, externalizing and internalizing symptoms, and overall mental health functioning in multi-ethnic studies. Endorsements of racial stress were associated with violent behaviors (Estrada-Martínez et al., 2012), somatization, and compulsions (Greer et al., 2009). Associations with emotional symptoms and diagnoses include interpersonal sensitivity (Greer et al., 2009), negative school belonging (Coleman & Stevenson, 2013), depression, and anxiety. Similarly, study findings



highlight the relationship between low levels of racial stress and positive school belonging (Coleman & Stevenson, 2013) and good general health (Anderson & Finch, 2017).

Several co-ed studies on Black Americans revealed similar connections. High levels of racial stress were associated with positive and negative affect (Coleman et al., 2013), suicidal thoughts (Chao & Green, 2011; Walker et al., 2014), and depression (Brody et al., 2008; Bowen-Reid & Harrell, 2002; Chao & Green, 2011; Estrada-Martínez et al., 2012; Walker et al., 2014). Other studies revealed conflicting findings between racial stress and depression. Carter & Reynolds (2011) found a relationship between low levels of racial stress and depression, while Lee et al., (2016) reported no association between the variables.

Multiple studies reported relationships between endorsed racial stress and anxiety (Bowen-Reid & Harrell, 2002; Carter & Walker, 2014; Chao & Green, 2011; Utsey & Giesbrecht, 2008), distress (Franklin-Jackson & Carter, 2007; Neville et al., 2004; Szymanski & Obiri, 2011), perceived stress (Longmire-Avital & McQueen, 2019, Pittman et al., 2017), academic stress (Neville, Heppner & Wang, 1997; (Neville et al., 2004), and acculturative stress (Pittman et al., 2019). Evidence of associations with experiences of racial stress and overall psychological health, somatization (Bowen-Reid & Harrell, 2002; Utsey & Giesbrecht, 2008), obsessive-compulsive behaviors, hostility, paranoid ideation, and psychoticism (Bowen-Reid & Harrell, 2002) were also present.

Some studies investigated specific types of racial stress. A relationship was found between endorsed institutional racial stress and cognitive anxiety symptoms in Black adults Lee et al. (2015). Experiences of individual and institutional racial stress were associated with depressive symptoms (Seaton, 2009; Seaton & Yip, 2009). Furthermore, endorsed individual and cultural racial stress were related to cognitive ability (Utsey et al., 2006).

Studies that examined high levels of racial stress found associations with low self-esteem (Seaton & Yip, 2009), poor life satisfaction (Driscoll et al., 2015), poor quality of life (Utsey et al., 2006), poor well-being (Chao & Green, 2011; McClain et al., 2016), lower cognitive ability (Utsey et al., 2006) and depression, anger, confusion, tension, and fatigue vigor (Carter, & Reynolds, 2011).

Several studies, however, did not report associations. There were no associations between racial stress and psychological well-being (Franklin-Jackson & Carter, 2007; Utsey et al., 2002), life satisfaction and self-esteem (Utsey et al., 2000), perceived stress, parenting stress, neighborhood stress and financial stress (Estrada-Martínez et al., 2012), hopelessness (Odafe et al., 2017), and depression or anxiety (Lee et al., 2016).

Among Black women specifically, endorsements of racial stress were associated with perceived stress (Davis, Levant, & Pryor et al., 2018; Fernander & Schumacher, 2008; Pittman & Kaur, 2018 ), distress, gender stress and appraisal (Woods-Giscombé & Lobel, 2008), paranoid ideation, phobic anxiety (Greer & Spalding, 2017), anxiety sensitivity (Greer, 2011), depression (Greer, 2011; Jones, Ross et al., 2007; Salami et al., 2019), somatization, obsessive-compulsive, and interpersonal sensitivity (Greer, 2011).

### **Explored Moderators in the Racial Stress Literature**

Some racial stress studies explored moderation effects. Among multi-ethnic co-ed studies, gender moderated the effect of racial stress on anxiety and obsessive-compulsive symptomatology. For example, minority males with higher levels of individual race-related stress had more severe anxiety and obsessive-compulsive symptoms than females (Greer et al., (2009). Gender also moderated the relationship between racial stress and sexual partners, so Black male adolescents with high levels of racial stress reported more sexual partners (Stevens-

Watkins et al., 2011) than females. Age was also identified as a moderator. Older patients endorsed racial stress had poorer treatment interference (Greer, 2016).

For Black adults, racial identity moderated the effect of racial stress on depression. Racial stress was associated with higher levels of depressive symptoms for alienated teens but not for buffering/defensive or idealized ones (Seaton, 2009). Carter et al. (2017) also found evidence of moderation for racial identity. More mature racial identity statuses were associated with decreased psychological distress and traumatic stress symptoms. In multi-ethnic studies, ethnic group membership moderated the frequency of racial stress. Black participants reported more racial stress than Asian and Latinx Americans (Utsey et al., 2002).

In summary, our review of the racial stress literature revealed associations with various psychopathology, including anxiety, obsessions, compulsions, depression, suicide ideation, and somatic and trauma symptoms for Black individuals, particularly, Black women. Associations with physical health outcomes with varying severity, from minor concerns to disease activity, were also identified. Importantly, these findings suggest that the mental and physical health effects of racial stress impact daily lifestyles and possibly even shorten the lifespan of Black women. Furthermore, personal and social-environmental factors were identified as moderators: gender, age, and racial identity. Additionally, our review of the literature supports shifting the focus of the racism literature to assessing emotional responses to racism, such as racial stress, instead of racist events. Studies document that the former is a predictor of poor health and is more likely to identify clinically-relevant populations, given the wide prevalence of racism experiences among Black women.

## **Racial Factors That May Influence Racial Stress among Black Women**

### ***Racial and Ethnic Affiliation***

Given that the racial stress literature is growing, additional factors, specifically racial factors, are likely to affect one's experience with racial stress. One factor that may influence racial stress experiences is racial and ethnic identity. Cross' Racial Identity Model illustrates there is substantial variation in racial identity development among minorities, which encompasses their understanding of race, their racial experiences, and the salience of their racial identity (Ross et al., 2017).

Research indicates that one's affiliation with their racial and ethnic identity can serve as a risk and protective factor for various mental health outcomes, including stress, anxiety, and depression (Utsey et al., 2002). For example, Black women with developing or weak racial and ethnic identities are more likely to report feelings of rejection, alienation, and isolation in settings with other minorities or majority group members (Williams et al., 2012). Similarly, these minorities may try to avoid race-centered conversations, as they likely bring mixed feelings about their identity. Additionally, these individuals are more likely to be unequipped with the knowledge or resources to cope with racial stress they encounter (Rogers Woods & Petrie, 2010). Research also underscores that minorities with strong racial identities are more likely to report feelings of belonging and a sense of group identity (Brook et al., 1998). These minorities value and invest their efforts in being in diverse and welcoming spaces. Furthermore, when these individuals find themselves in racially discriminatory and biased environments, they likely report feelings of unhappiness, anger, and frustration. Minorities with a strong sense of racial and ethnic identity are likely to be bothered and made uncomfortable by racial stress, possibly affecting their mental and physical health (Ross et al., 2017).

### ***Skin Tone***

Other racial factors of possible influence are less dynamic. For example, skin tone is a frequent topic of discussion in Black communities, as it's associated with pain and privilege (Slaughter-Acey et al., 2019). Some races such Black and Asian contain individuals with skin-tones of various distinct shades (Harris & Barlett, 2009; Wen et al., 2022). Additionally, during colonization, slave owners often raped their enslaved people. Consequently, creating generations of mixed-race offspring, who typically have fairer skin than people with only African ancestry. The fair-skinned offspring of slave-owners were frequently given less laborious duties compared to darker-skinned enslaved people (Warren, 2016).

In the present day, the United States' population of individuals identifying as biracial or multiracial grows exponentially due to normalized interracial dating practices (Yancey & Yancey, 1998). Biracial, multiracial and Black individuals have varying skin tones, from fair to dark. Fair skin and light brown skin tones, compared to dark brown, more closely resembled the skin tones of White individuals. Thus, these skin tones, by many in the US and globally who adhere to Eurocentric beauty standards, are more desirable and acceptable. Individuals with darker skin tones face discrimination, known widely as colorism (Blake et al., 2017).

Research indicates that experiences of colorism are common amongst Black adolescent girls and women and frequently arise in conversations and interactions with Black peers and family members (Breland et al., 2002). Evidence shows that light-skinned Black women are more likely to receive jobs, date, and marry than their darker skin counterparts (Hunter, 2002; Hunter, 1998). Dark-skinned Black women also report more frequent experiences receiving derogatory comments and harsher punishment from teachers and police (Hannon et al., 2013). To reduce their experiences with discrimination and appear desirable to those who idolize Western beauty, some dark-skin women use dangerous methods to bleach and whiten their skin (Swinton-

Jackson, 2021). Furthermore, frequent experiences of colorism were associated with negative outcomes contributing to stress and depression (Laidley et al., 2019; Louie, 2020) for Black girls and women.

In summary, colorism undoubtedly affects the well-being of darker-skinned individuals, specifically brown and dark skin Black females. Such adverse experiences can be viewed as a racial related stressor with adverse mental and physical consequences.

### ***Hair Texture***

Similar to skin tone, hair texture is a racial feature that affects the lives of many Black women (Shepherd, 2018). Black hair textures vary on a spectrum from silky straight to tightly-coiled (Robinson, 2011). Additionally, some use chemicals such as relaxers, keratin treatments, or excessive heat, permanently straightening or altering their natural hair pattern. Black women with looser S-shaped curl patterns more closely resemble the hair textures of White women and, as a result, are often deemed more acceptable by Western standards (Johnson & Bankhead, 2014; Grill, 2015). Black women with coily, kinky, zig-zag patterned, or afro-textured hair report the most frequent discrimination. Discrimination based on hair texture is known as texturism (Joseph-Salisbury & Connelly, 2018; Randle, 2015; Tate, 2017). Black women with afro-textured hair are more likely to be viewed as unattractive and unkept and receive harsh comments from employers. Others have been forced to cut or manipulate their hair so that some will perceive their natural hair as more professional (Donahoo & Smith, 2019). Additionally, Black girls have been suspended and expelled from school for wearing their hair as it naturally grows from their scalp (Joseph-Salisbury & Connelly, 2018; Randle, 2015; Tate, 2017).

Research reports that experiences of texturism were associated with feelings of sadness, anger, confusion, and anxiety (Powell, 2018; Wilson et al., 2018). To reduce the negative impact

of texturism, some states, including California, New Jersey, Virginia, Maryland, Colorado, and Washington, enacted the Crown Act (Create a Respectful and Open Workplace for Natural Hair), prohibiting discrimination against textured natural hairstyles (Donahoo & Smith, 2022; Hamilton, 2021; Lee & Nambudiri, 2021). Therefore, the scientific community and state governments recognized hair texture as a racial-related stressor that negatively affects Black women, particularly those with kinky and coily hair textures.

## **Present Study**

The current racial stress literature is developing. It highlights the connection between racial stress and poor mental and physical health consequences. Most racial stress studies explored this construct in samples of Black adult women (Somerville, 2021). However, few studies investigated the impact of racial stress on health behaviors in a sample of college-aged Black women. Evidence also documents that health behaviors directly impact mental and physical health outcomes. Patterns of poor and risky health behaviors are clinically relevant as they signal the likely subsequent decline of one's health and, in some cases, functioning (Cawley & Ruhm, 2011). Furthermore, this racial stress review identified that some studies documented evidence of moderation (Somerville, 2021). Future research should investigate additional factors that may disrupt the influence of racial stress on health. As discussed above, Harrell's conceptualization model of racial stress posits that personal and socio-environmental factors influence one's experience with racial stress, ultimately affecting its impact on the individual.

Given the documented evidence of racial stress, its impact on health, and the current gaps in the literature, this study aims to quantitatively investigate racial stress and its influence on internalizing symptoms, and health behaviors in a sample of college-aged Black women. We also aim to explore the intervening influence of personal racial factors. We hypothesize the following:

**H<sub>1</sub>:** Racial stress will predict internalizing symptoms such that participants with higher racial stress levels will be more likely to have higher levels of internalizing symptoms.

**H<sub>2</sub>:** Racial stress will predict poor weight management behaviors (e.g., diet and physical activity), such that participants with higher racial stress levels will be more likely to have an unhealthy diet and be inactive.

**H<sub>3</sub>:** Racial stress will predict risky health behaviors (e.g., alcohol use, marijuana use, other substance use, and the number of sexual partners), such that participants with higher racial stress levels will be more likely to drink alcohol, smoke marijuana, use other substances, and have a higher number of sexual partners.

**H<sub>4</sub>:** Racial and ethnic identity will moderate the relationships between racial stress and internalizing symptoms, diet, physical activity, alcohol use, marijuana use, other substance use, and number of sexual partners such that there will be an positive relationship between racial stress and the identified outcomes above with the effect being greater for participants with weak racial and ethnic identities.

**H<sub>5</sub>:** Skin tone will moderate the relationships between racial stress and internalizing symptoms, diet, physical activity, alcohol use, marijuana use, other substance use, and number of sexual partners such that there will be an positive relationship between racial stress and the identified outcomes above with the effect being greater for participants with darker skin tones.

**H<sub>6</sub>:** Hair texture will moderate the relationships between racial stress and internalizing symptoms, diet, physical activity, alcohol use, marijuana use, other substance use, and number of sexual partners such that there will be an positive relationship between racial stress and the identified outcomes above with the effect being greater for participants with kinkier hair textures.



## **Method**

### **Participants**

This study is part of a larger study that explored the experiences and behaviors of college-aged Black women ( $N=200$ ) (Jean, 2022). The previous study's inclusion criteria included self-identifying as Black and female, being between the ages of 18 and 26, and attended primary and secondary school in the United States. See Data Cleaning methods in the Results section, which resulted in a final sample size of 199 self-identified Black women with a mean age of 21.15 ( $SD = 2.14$ , Range = 8). All participants were also students enrolled at Kent State University, a large midwestern public university. See Table 1 for the full list of demographic information.

### **Procedures**

Kent State University Institutional Review Board (IRB) approved all study procedures. Study recruitment included obtaining the email addresses of Black female undergraduate and graduate students from the University Registrar and sending an email announcement of the study. Prospective participants clicked a link in their email that directed them to an informed consent form. Next, participants navigated to an anonymous online survey via *Qualtrics*. The survey required participants to provide demographic information to confirm study eligibility prior to responding to study measures of racial stress, internalizing symptoms, weight management behaviors, risky health behaviors, racial and ethnic identity, and physical features. After survey completion, participants entered their email address to receive a \$10 Amazon eGift

card as compensation. Study data collection commenced in April 2021 and concluded in June 2021. It is noteworthy that study data collection occurred during the Covid-19 pandemic.

## **Measures**

***Demographic survey.*** A 11-item self-report demographic survey was administered to collect information on participants' self-identified race, ethnicity, gender, age, school type, education level, parents' education levels, family household income, household structure, and frequency of suspensions and expulsions. This information was used to confirm study inclusion criteria, describe the sample, and gather information for potential covariates. The socioeconomic status and behavior-related information, specifically, was collected to assess potential covariation, given their established association with mental health outcomes and health behaviors (Ravens-Sieberer et al., 2022; Meyer et al., 2014).

***Racial stress.*** The Index of Race-Related Stress Brief Version (IRRS-B) is a 22-item self-report assessment designed to identify experiences of racism and assess the intensity of related racial stress (Chapman-Hilliard et al., 2020; Utsey, 1999). The IRRS-B was constructed based on popularized theories of racism (Jones, 1972; Essed, 1990) and stress (Lazarus & Folkman, 1984). It is the most widely used assessment of racial stress and contains a total global score of racial stress and three subscales: institutional, cultural, and individual (Greer et al., 2009). The institutional subscale measures experiences with discrimination across policies, practices, and procedures in institutions (e.g., schools, banks, government, and stores). The cultural subscale measures experiences encountering discrimination about racially specific values, beliefs, customs, or arts. The individual subscale measures experiences with racial discrimination received from one or more individuals (Chapman-Hilliard et al., 2020; Utsey, 1999). Participants

rate IRRS-B items utilizing a 5-point Likert scale from 0 – *this never happened to me* to 4– *this event happened, and I was extremely upset*. Item responses are summed to yield total scores. Higher scores indicate participants endorsed greater intensity of racial stress. Previous research suggests that the IRRS-B exhibits good psychometric properties, including good internal consistency and reliability among items and validation ( $\alpha = .8$ ) for IRRS-B factor structure and use with Black populations (Chapman-Hilliard et al., 2020). The current study only utilized the total racial stress score, given that the relationships between racial stress and the study's proposed moderators and outcomes has not yet been investigated. The total racial score demonstrated reliable internal consistency ( $\alpha = .87$ ).

***Internalizing symptoms.*** The Depression Anxiety Stress Scale (DASS-21) is a 21-item assessment that measures symptoms of anxiety, depression, and stress (Ali et al., 2021; Henry & Crawford, 2005). Each has a subscale containing 7 question items. Sample items read, "I experienced breathing difficulty," "I felt that I had nothing to look forward to," and "I found it hard to wind down." Participants rate items using a 4-point Likert scale from 0 - *Did not apply to me at all* to 3 *Applied to me very much or most of the time*. Each subscale's items are summed to yield subscale total scores. The summation of subscales score creates a DASS-21 Total score. Total scores can be interpreted clinically as follows: scores between 0-9 are indicative of typical symptoms; 10-13 are indicative of mild symptoms; 14-20 are indicative of moderate symptoms; 21-27 are indicative of severe symptoms; 28 and higher are indicative of extremely severe. Previous studies evidenced the DASS-21's strong reliability and validity ( $\alpha = .9$ ) among samples of Black college students (Norton, 2007; West et al., 2010). The current study only utilized the DASS-21 Total Score given the significant overlap among internalizing symptoms (Conway et al., 2019). The DASS-21 Total Score demonstrated excellent reliability ( $\alpha = .94$ ).

### ***Weight Management Behaviors.***

***Diet.*** Starting the Conversation (STC) is an 8-item self-report assessment that measures the frequency of dietary behaviors over the past few months. This STC assessment was initially developed by the Center for Health Promotion and Disease Prevention, the University of North Carolina at Chapel Hill, to guide health promotion recommendations. Sample STC question items read, "how many times a week did you eat fast food meals or snacks," "how many servings of fruit did you eat each day," and "how much margarine, butter, or meat fat do you use to season vegetables or put on potatoes, bread or corn"? Each question item has three response choices corresponding to the most healthful dietary practices, less healthy practices, and the least. Response options for frequency varies based on the question (e.g., less than 1 time, 1-3 times, 4 or more times; 5 or more times, 3-4 times, 2 or less; very little, some, and a lot). Response items are scored so that the most healthful dietary practices receive a score of 0; less healthy practices receive a score of 1; least healthy practices receive a score of 2. The eight STC item scores are summed to generate a total score. STC total scores range from 0-16, with higher scores being indicative of poorer dietary behaviors. Multiple studies indicate The STC has is a valid assessment of diet for Black individuals (McGarity-Palmer, 2019; Paxton et al., 2011; Schrubbe et al., 2016). In the current sample internal consistency was poor ( $\alpha = .42$ ). This is consistent with the expectations of the STC creators and previous studies, which indicate the STC captures different elements of dietary behavior (McGarity-Palmer, 2019; Paxton et al., 2011).

***Physical activity.*** The Stanford Brief Activity Survey (SBAS) is a 2-item self-report assessment that measures occupational and leisure-related physical activities in the past year (Taylor-Piliae et al., 2007). The SBAS questions direct participants to indicate a statement that best describes, "the kinds of physical activity you usually performed while on the job this last

year" and "the way you spent your leisure time during most of the last year." Each question has 5 response options with increasing activity frequency and intensity levels from 1-5, (e.g., unemployment, stationary job, some manual labor, hard physical labor, light chores and watching television, walking, slow jogging, running, and active fitness routine). The two SBAS item scores are averaged to generate an overall physical activity score. Scores can be interpreted as follows: 1 - inactive, 2 - light, 3 - moderate, 4 - hard, and 5- very hard. Previous studies demonstrate The SBAS is a valid assessment of physical activity for Black women (Robinson, 2009; Robinson & Wicks, 2012). Given that SBAS only contains 2 items, measurements of internal consistency such as Cronbach's alpha likely underestimate the scale's reliability c As recommended by Eisinga et al., 2013) the Spearman-Brown coefficient was calculated and demonstrated poor sample reliability ( $r_s = .058$ ). The scale's poor internal consistency can be attributed to the SBAS assessing activity in two different settings (Taylor-Piliae et al., 2007).

***Risky health behaviors.*** Four questions utilized by the National Longitudinal Study of Adolescent Health were used to assess participants' use of alcohol, marijuana, and other substances (e.g., cocaine, heroin, crystal meth, and mushrooms) and their number of sexual partners in the past year (Bernard, 2010; Willoughby and Dworkin, 2009). Sample questions read, "During the 12 months, on how many days did you use marijuana" and "... on how many days did you drink five or more drinks in a row?". Participants rate their frequency of engagement in such risky behaviors using a 6-point Likert scale from 0-never to 5-everyday or almost every day.

***Racial Factors.***

***Racial & ethnic identity affiliation.*** The Multigroup Ethnic Identity Measure- Revised (MEIM-R; Phinney & Ong, 2007) is a 7-item self-report assessment that measures aspects of

ethnic identity. The first question is open-ended and asks participants to indicate their ethnicity. The remaining six questions examine participant ethnic identity exploration and commitment. Examples of question items include, "I have spent time trying to find out more about my ethnic group, such as its history, traditions, and customs," and "I feel a strong attachment towards my own ethnic group." Participants rate items using a 5-point Likert scale with 1 being "Strongly Disagree" to 5 "Strongly Agree."). MEIM items are summed, creating a total racial identity score. Responses to the exploration and commitment items are also summed to create two subscale scores. Previous literature has demonstrated good reliability of this measure among Black young adults (Brown et al., 2014; Chakawa et al., 2015). The current study utilized the total racial identity score, given the limited evidence of relationships between racial stress and the study's proposed moderators and outcomes. The total racial identity score demonstrated adequate reliability ( $\alpha = .83$ ).

***Skin tone.*** The Massey and Martin Skin Color Scale (Hersch, 2011; Massey et al., 2003; Perry et al., 2013) is a palette of ten different skin tone complexion visuals. Skin tones range from fair (1) to very dark (10). Participants were asked to use the palette to self-report which color best resembles their facial skin tone. Higher scores reflect darker skin complexions. See Appendix A for visual representations of skin tones classified by the Massey and Martin Skin Color Scale.

***Hair texture.*** The Andre Walker Hair Typing System is a 10-point alpha-numeric classification that describes hair textures with visuals. Hair textures range from silky-1a to 4c-kinky (Walker & Wiltz, 1997). Participants were asked to use the typing system to self-report which classification best resembles their hair. Higher scores reflect kinkier hair textures. See

Appendix B for visual representations of hair textures classified by the Andre Walker Hair Typing System.

## **Data analysis plan**

### ***Power Analysis***

We conducted power analyses to determine an appropriate sample size for our study. According to G\*Power, approximately 77 study participants were required to detect an effect for our study given our specific hypotheses (Erdfelder et al., 1996). Specifically, an a priori power analysis for linear regression with one tested predictor, with an alpha of 0.05, a power of 0.80, and a medium effect size ( $f^2 = .15$ ) (Faul et al., 2013), indicated that a sample size of 55 was needed. When an additional predictor variable and interaction terms were added to the model to account for the moderation analyses, a sample size of 150 was needed.

### ***Preliminary Analyses***

Study data were collected online via Qualtrics, exported to SPSS (Version 27), and cleaned in preparation for analysis. Prior to conducting the study's primary analyses, preliminary descriptive analyses were conducted to evaluate the data appropriateness for the intended study analyses. As Tabachnick and Fidell (2007) recommended, all study variables were assessed for the assumption of normality. Skewness and kurtosis values were evaluated according to Kline's (2006) recommendation, which defines skewness absolute values of 3 and kurtosis absolute values 10 as acceptable. Additionally, the linearity and multicollinearity among all study variables was evaluated by conducting Pearson product-moment correlations. Correlations above .8 were indicative of multicollinearity (Kline, 2006). Correlations among the following potential

covariates age, education level, parents' education levels, family household income, and frequency of suspensions and expulsions and study variables were evaluated.

### ***Primary and Secondary Analyses***

Three regression analyses were conducted to determine if high levels of racial stress are more likely to predicts high levels of internalizing symptoms, engagement in poor weight management behaviors (e.g., diet and physical activity), and risky health behaviors (e.g., alcohol use, marijuana use, other substance use, and the number of sexual partners).

Separate analyses were conducted with the Hayes PROCESS (Haynes, 2017) to examine whether skin tone, hair texture, or racial and ethnic identity affiliation, moderate the relation between racial stress and internalizing symptoms, weight management behaviors, or risky health behaviors. Further, if an interaction was found to be significant, simple slope analyses were examined. The present study intentionally did not mean center study variables prior to conducting moderation analyses. This decision was made to ease interpretability of the main and moderations effect and retain the meaning of the variable scales and associated zero values (Hayes, 2013; Iacobucci et al., 2017). Bootstrapping were completed with 5,000 random samples generated from the observed covariance matrix to estimate the standard errors of parameter estimates and the bias-corrected confidence intervals of the indirect effects.



## **Results**

### **Data Cleaning**

Study data were taken from a larger study, in which extensive data cleaning procedures were previously performed ( $N=200$ ). Three validation checks (i.e., Please select Neither agree nor disagree, Please select “3” for this question, and Please select “Rarely” for this question) were included in survey administration to assess the accuracy and integrity of data by funneling out random responding, inconsistent responding, and content-specific responding. As a result, six participants were removed from the sample for not responding appropriately to the validation questions. Data cleaning also included removal of univariate outliers. Scores greater than 3.29 standard deviations were considered outliers and excluded from affected analyses. For the present study, one participant was removed from the sample as they identified as intersex ( $N=199$ ).

### **Normality**

Descriptive analyses revealed that the following variables: racial identity, physical activity, marijuana use, and alcohol use were positively skewed. The variables illicit drug use and the number of sexual partners were negatively skewed. To reduce skew, positively skewed variables were square-root transformed and negatively skewed variables were inverse transformed. The remaining study variables were normally distributed (Kline, 2006).

### **Sample Characteristics, Experiences & Health Behaviors**

Physically, the average participant endorsed having a medium brown skin complexion ( $M=4.32$ ,  $SD=1.85$ ) and a kinky-curly hair texture ( $M=7.97$ ,  $SD=1.56$ ). Participants also reported a strong affiliation to their racial and ethnic identity on average ( $M=27.05$ ,  $SD=4.75$ ). Our results indicate that our participants experienced racism and related racial stress with the average,

participant scoring 50.71 ( $SD=15.60$ ) out of 100 on the IRRS-B. Additionally, participants endorsed clinically severe internalizing symptoms ( $M=23.18$ ,  $SD=14.78$ ). Participants also reported having some poor dietary behaviors, with the average STC score being 10.10 ( $SD = 2.36$ ) out total 16, with higher scores being indicative of poorer diets. Participants endorsed engagement in light physical activity ( $M=2.38$ ,  $SD=.97$ ). Overall, participants endorsed minimal drug use, with the average number of days of marijuana use and other drugs use (cocaine, heroin, crystal meth, and mushrooms) reported during the past year being less than two days, ( $M=1.11$ ,  $SD=.42$ ) and ( $M=1.1$ ,  $SD=1.76$ ) respectively. Similarly, participants reported minimal alcohol consumption (i.e., 5 drinks or more drinks in a row) ( $M=1.31$ ,  $SD=1.76$ ). Participants also noted on average having 2.73 ( $SD=3.98$ ) sexual partners. See Table 1 for complete participant demographic and Table 2 for descriptive information.

### **Direct Relationships**

The bivariate correlations revealed significant positive relationships between racial stress and internalizing symptoms ( $r(199) = .20$ ,  $p<.001$ ) and marijuana use ( $r(199) = .20$ ,  $p<.001$ ) and a significant negative relationship between physical activity ( $r(196) = -.18$ ,  $p<.05$ ). The associations between racial stress and poor diet ( $r(199) = -.02$ ,  $p=.768$ ), alcohol use ( $r(199) = .14$ ,  $p=.056$ ), drug use ( $r(199) = .11$ ,  $p=.131$ ), and number of sex partners stress ( $r(199) = .06$ ,  $p=.407$ ) were non-significant. The variables age, income, and participant education revealed significant correlations with study outcomes variables, and thus were included as covariates in the model. Correlational analyses revealed a negative relationship between age and diet ( $r(199) = -.15$ ,  $p<.05$ ) and positive relationships among age and physical activity ( $r(199) = .28$ ,  $p<.001$ ), drug use ( $r(199) = .18$ ,  $p<.001$ ), and number of sexual partners, ( $r(199) = .17$ ,  $p<.05$ ). Our results indicated a negative relationship ( $r(199) = -.15$ ,  $p<.05$ ) between income and internalizing

symptoms. Additionally, our findings highlighted a positive relationship between education and physical activity ( $r(199) = .15, p < .05$ ) and alcohol use ( $r(199) = .16, p < .05$ ) and a negative relationship between education and diet ( $r(199) = -.17, p < .05$ ). See Table 2 for all correlations. Other demographic variables including participant's mother's education, father's education, and the number of suspension and expulsions were not correlated with any of the outcome variables. Therefore, they were not included in the model as covariates.

### **Assessing the Moderating Racial Factors on Racial Stress and Internalizing Symptoms**

#### ***Skin Tone***

A moderation test was conducted to examine the interaction of racial stress and skin tone on internalizing symptoms after controlling for age, family income, and education level. In the analysis, racial stress was entered as the predictor variable (X), skin tone as the moderator variable (W), and internalizing symptoms as the outcome variable (Y). The regression model indicated that approximately 16% of the variance in internalizing symptoms could be accounted for by the model  $R^2 = .16, F(6, 190) = 6.09, p < .001$ . There was a not significant main effect of racial stress on internalizing symptoms ( $B = -.02, p = .89$ ). However, the main effect of skin tone ( $B = -4.27, p = .02$ ) and the interaction between racial stress and skin tone ( $B = .08, p = .03$ ) on internalizing symptoms were significant. See Tables 11.

To further investigate the effects of this interaction, we conducted a simple slopes analysis examining three different levels of skin tone: light brown, medium brown, and dark brown (Figure 1). Results revealed that for light brown skin tones ( $B = .21, p < .01$ ), medium brown skin tones ( $B = .29, p < .001$ ) and dark skin tones ( $B = .45, p < .001$ ) the effect of racial

stress on internalizing symptoms was significant. Further, these results suggest that the impact of racial stress on internalizing symptoms increases as skin tone darkens. See Table 32.

### ***Hair Texture***

A moderation test was conducted to examine the interaction of racial stress and hair texture on internalizing symptoms after controlling for age, family income, and education level. In the analysis, racial stress was entered as the predictor variable (X), hair texture as the moderator variable (W), and internalizing symptoms as the outcome variable (Y). The regression model indicated that approximately 14% of the variance in internalizing symptoms could be accounted for by the model,  $R^2 = .14$ ,  $F(6, 190) = 5.09$ ,  $p < .001$ . There was a not significant main effect of racial stress on internalizing symptoms ( $B = .28$ ,  $p = .42$ ). The main effect of hair texture ( $B = .28$ ,  $p = .42$ ) and the Interaction between racial stress and hair texture ( $B = .01$ ,  $p = .90$ ) were not significant. See Table 12. These results indicate that hair texture did not moderate the relationship between racial stress and internalizing symptoms.

### ***Racial and Ethnic Identity***

A moderation test was conducted to examine the interaction of racial stress and racial and ethnic identity on internalizing symptoms after controlling for age, family income, and education level. In the analysis, racial stress was entered as the predictor variable (X), racial and ethnic identity as the moderator variable (W), and internalizing symptoms as the outcome variable (Y). The regression model indicated that approximately 15% of the variance in internalizing symptoms could be accounted for by the model,  $R^2 = .15$ ,  $F(6, 189) = 5.69$ ,  $p < .001$ . There was not a significant main effect of racial stress on internalizing symptoms ( $B = .37$ ,  $p = .16$ ). The main effect of racial and ethnic identity ( $B = .37$ ,  $p = .16$ ), and the interaction between racial

stress and racial and ethnic identity ( $B = -.00, p = .98$ ) were not significant. See Table 13. These results indicate that racial and ethnic identity did not moderate the relationship between racial stress and internalizing symptoms.

## **Assessing the Moderating Racial Factors on Racial Stress and Weight Management**

### ***Skin Tone***

Two separate moderation analyses were conducted to examine the interaction of racial stress and skin tone on weight management behaviors (diet and physical activity) after controlling for age, family income, and education level. In the first analysis, racial stress was entered as the predictor variable (X), skin tone was entered as the moderator variable (W), and diet was entered as the outcome variable (Y). Overall, the regression model was not significant  $R^2 = .03, F(6, 190) = 1.05, p > .05$ . There was not a significant main effect of racial stress on diet ( $B = -.02, p = .56$ ). Additionally, the main effect of skin tone ( $B = -.23, p = .47$ ) and the interaction between racial stress and skin tone ( $B = .00, p = .55$ ) were not significant. See Table 14.

In the second analysis, racial stress was entered as the predictor variable (X), skin tone was entered as the moderator variable (W), and physical activity was entered as the outcome variable (Y). The regression model indicated that approximately 7% of the variance in physical activity could be accounted for by the model,  $R^2 = .07, F(6, 187) = 2.28, p < .05$ . There was not a significant main effect of racial stress on physical activity ( $B = .01, p = .26$ ). Further, the main effect of skin tone ( $B = .08, p = .55$ ) and the interaction between racial stress and skin tone ( $B = -.00, p = .79$ ) were not significant. See Table 15. Collectively, these results indicate that skin tone did not moderate the relationship between racial stress and diet or physical activity.

### ***Hair Texture***

Two separate moderation analyses were conducted to examine the interaction of racial stress and hair texture on weight management behaviors (diet and physical activity) after controlling for age, family income, and education level. In the first analysis, racial stress was entered as the predictor variable (X), hair texture was entered as the moderator variable (W), and diet was entered as the outcome variable (Y). Overall, the regression model was not significant  $R^2 = .04$ ,  $F(6, 190) = 1.25$ ,  $p > .05$ . There was not a significant main effect of racial stress on diet ( $B = .06$ ,  $p = .32$ ). Additionally, the main effect of hair texture ( $B = .45$ ,  $p = .22$ ) and the interaction between racial stress and Hair Texture ( $B = -.01$ ,  $p = .30$ ) were not significant. See Table 16.

In the second analysis, racial stress was entered as the predictor variable (X), hair texture was entered as the moderator variable (W), and physical activity was entered as the outcome variable (Y). Overall, the regression model was not significant  $R^2 = .03$ ,  $F(3, 192) = 2.22$ ,  $p > .05$ . There was not a significant main effect of racial stress on physical activity ( $B = .00$ ,  $p = .97$ ). Additionally, the main effect of hair texture ( $B = -.09$ ,  $p = .57$ ) and the interaction between racial stress and hair texture ( $B = .00$ ,  $p = .67$ ) were not significant. See Table 17. Collectively, these results indicate that hair texture did not moderate the relationship between racial stress and diet or physical activity.

### ***Racial and Ethnic Identity***

Two separate moderation analyses were conducted to examine the interaction of racial stress and racial and ethnic identity on weight management behaviors (diet and physical activity) after controlling for age, family income, and education level. In the first analysis, racial stress

was entered as the predictor variable (X), racial and ethnic identity was entered as the moderator variable (W), and diet was entered as the outcome variable (Y). Overall, the regression model was not significant  $R^2 = .03$ ,  $F(6, 189) = 1.00$ ,  $p > .05$ . There was not a significant main effect of racial stress on diet ( $B = .02$ ,  $p = .72$ ). Additionally, the main effect of racial and ethnic identity ( $B = .01$ ,  $p = .93$ ) and the interaction between racial stress and hair texture ( $B = -.00$ ,  $p = .74$ ) were not significant. See Table 18.

In the second analysis, racial stress was entered as the predictor variable (X), hair texture was entered as the moderator variable (W), and physical activity was entered as the outcome variable (Y). Overall, the regression model was not significant  $R^2 = .06$ ,  $F(6, 187) = 2.13$ ,  $p = .05$ . There was not a significant main effect of racial stress on physical activity ( $B = -.00$ ,  $p = .89$ ). Additionally, the main effect of hair texture ( $B = -.11$ ,  $p = .46$ ) and the interaction between racial stress and hair texture ( $B = .00$ ,  $p = .55$ ) were not significant. See Table 19. Collectively, these results indicate that racial and ethnic identity did not moderate the relationship between racial stress and diet or physical activity.

## **Assessing the Moderating Racial Factors on Racial Stress and Risky Behaviors**

### ***Skin Tone***

Four separate moderation analyses were conducted to examine the interaction of racial stress and skin tone on risky behaviors (alcohol, marijuana and other drug use and number of sexual partners) after controlling for age, family income, and education level. In the first analysis, Total Racial Stress was entered as the predictor variable (X), skin tone was entered as the moderator variable (W), and alcohol use was entered as the outcome variable (Y). The regression model indicated that approximately 12% of the variance in alcohol use could be

accounted for by the model  $R^2 = .12$ ,  $F(6, 190) = 4.35$ ,  $p < .001$ . There was not a significant main effect of racial stress on alcohol use ( $B = -.01$ ,  $p = .48$ ). Additionally, the main effect of skin tone ( $B = -.31$ ,  $p = .07$ ) and the interaction between racial stress and skin tone ( $B = .01$ ,  $p = .13$ ) were not significant. See Table 20.

In the second analysis, racial stress was entered as the predictor variable (X), skin tone was entered as the moderator variable (W), and marijuana use was entered as the outcome variable (Y). The regression model indicated that approximately 8% of the variance in marijuana use could be accounted for by the model,  $R^2 = .08$ ,  $F(6, 190) = 2.75$ ,  $p < .05$ . There was a significant main effect of racial stress on marijuana use ( $B = .04$ ,  $p = .05$ ). Additionally, the main effect of skin tone ( $B = .11$ ,  $p = .65$ ) and the interaction between racial stress and skin tone ( $B = -.00$ ,  $p = .32$ ) were not significant. See Table 21.

In the third analysis, racial stress was entered as the predictor variable (X), skin tone was entered as the moderator variable (W), and drug use was entered as the outcome variable (Y). Overall, the regression model was not significant  $R^2 = .02$ ,  $F(3, 195) = 1.57$ ,  $p > .05$ . There was a main effect on racial stress on drug use ( $B = .01$ ,  $p = .06$ ) was not significant. The main effect of skin tone ( $B = .08$ ,  $p = .17$ ) and the interaction between racial stress and skin tone ( $B = -.00$ ,  $p = .13$ ) were also not significant. See Table 22.

In the final analysis, racial stress was entered as the predictor variable (X), skin tone was entered as the moderator variable (W), and number of sex partners were entered as the outcome variable (Y). Overall, the regression model was not significant  $R^2 = .05$ ,  $F(6, 188) = 1.78$ ,  $p > .05$ . There was not significant main effect on racial stress on number of sex partners ( $B = .10$ ,  $p = .05$ ), although it was approaching significance. Additionally, the main effect of skin tone ( $B =$



.86,  $p = .11$ ) and the interaction between racial stress and skin ( $B = -.02$ ,  $p = .06$ ) were not significant. See Table 23. Collectively, these results indicate that skin tone did not moderate the relationship between racial stress and risky behaviors (e.g., alcohol, marijuana and other drug use and number of sexual partners).

### ***Hair Texture***

Four separate moderation analyses were conducted to examine the interaction of racial stress and hair texture on risky behaviors (alcohol, marijuana and other drug use and number of sexual partners) after controlling for age, family income, and education. In the first analysis, racial stress was entered as the predictor variable (X), hair texture was entered as the moderator variable (W), and alcohol use was entered as the outcome variable (Y). The regression model indicated that approximately 13% of the variance in alcohol use could be accounted for by the model,  $R^2 = .13$ ,  $F(6, 190) = 4.70$ ,  $p < .001$ . There was not a significant main effect of racial stress on alcohol use ( $B = -.02$ ,  $p = .54$ ). Further, the main effect of hair texture ( $B = -.31$ ,  $p = .11$ ) and the interaction between racial stress and hair texture ( $B = .00$ ,  $p = .31$ ) were not significant. See Table 24.

In the second analysis, racial stress was entered as the predictor variable (X), hair texture was entered as the moderator variable (W), and marijuana use was entered as the outcome variable (Y). The regression model indicated that approximately 6% of the variance in marijuana use could be accounted for by the model,  $R^2 = .06$ ,  $F(6, 190) = 2.04$ ,  $p > .05$ . There was not a significant main effect of racial stress on marijuana use ( $B = .03$ ,  $p = .49$ ). Additionally, the main effect of hair texture ( $B = .06$ ,  $p = .83$ ) and the interaction between racial stress and hair texture ( $B = -.00$ ,  $p = .87$ ) were not significant. See Table 25.

In the third analysis, racial stress was entered as the predictor variable (X), hair texture was entered as the moderator variable (W), and drug use was entered as the outcome variable (Y). The regression model indicated that approximately 10% of the variance in drug use could be accounted for by the model,  $R^2 = .10$ ,  $F(6, 190) = 3.44$ ,  $p < .01$ . There was not a significant main effect of racial stress on other drug use ( $B = .02$ ,  $p = .10$ ). Additionally, the main effect of hair texture ( $B = .09$ ,  $p = .16$ ) and the interaction between racial stress and hair texture ( $B = -.00$ ,  $p = .17$ ) were not significant. See Table 26.

In the final analysis, racial stress was entered as the predictor variable (X), hair texture was entered as the moderator variable (W), and number of sex partners was entered as the outcome variable (Y). The regression model indicated that approximately 6% of the variance in the number of sex partners could be accounted for by the model,  $R^2 = .06$ ,  $F(6, 188) = 1.93$ ,  $p > .05$ . There was a significant main effect of racial stress on the number of sex partners ( $B = .22$ ,  $p = .03$ ). Additionally, the main effect of hair texture ( $B = 1.17$ ,  $p = .06$ ) was not significant. However, the interaction between racial stress and hair texture ( $B = -.03$ ,  $p < .05$ ) was also significant. See Table 27. Collectively, these results indicate that hair texture did not moderate the relationship between racial stress and alcohol, marijuana, and other drug use. However, hair texture did moderate the relationship between racial stress and number of sexual partners.

To further investigate the effects of this interaction, we conducted a simple slopes analysis examining three different levels of hair texture: curly, kinky or coily, and tightly coiled. (Figure 2). Results revealed that for looser curly hair textures, the effect of racial stress on number of sexual partners was significant ( $B = .06$ ,  $p < .05$ ). However, for kinky or coiled textures ( $B = .01$ ,  $p = .52$ ) and tightly coiled kinky/afro textures the effects were not significant ( $B$

= -.04  $p = .18$ ). These results suggest that for women with curly hair textures an increase in racial stress is associated with an increase in their number of sexual partners. See Table 33.

### ***Racial and Ethnic Identity***

Four separate moderation analyses were conducted to examine the interaction of racial stress and racial and ethnic identity on risky behaviors (alcohol, marijuana and other drug use and number of sexual partners) after controlling for age, family income, and education level. In the first analysis, racial stress was entered as the predictor variable (X), hair texture was entered as the moderator variable (W), and alcohol use was entered as the outcome variable (Y). The regression model indicated that approximately 11% of the variance in alcohol use could be accounted for by the model,  $R^2 = .11$ ,  $F(6, 189) = 3.99$ ,  $p < .001$ . There was not a significant main effect of racial stress on alcohol use ( $B = -.01$ ,  $p = .59$ ). Additionally, the main effect of hair texture ( $B = -.07$ ,  $p = .20$ ) and the interaction between racial stress and hair texture ( $B = .00$ ,  $p = .27$ ) were not significant. See Table 28.

In the second analysis, racial stress was entered as the predictor variable (X), racial and ethnic identity was entered as the moderator variable (W), and marijuana use was entered as the outcome variable (Y). The regression model indicated that approximately 7% of the variance in the marijuana use could be accounted for by the model,  $R^2 = .07$ ,  $F(6, 189) = 2.31$ ,  $p < .05$ . There was not a significant main effect of racial stress on marijuana use ( $B = -.01$ ,  $p = .67$ ). Additionally, the main effect of racial and ethnic identity ( $B = -.09$ ,  $p = .21$ ) and the interaction between racial stress and racial and ethnic identity ( $B = .00$ ,  $p = .23$ ) were not significant. See Table 29.

In the third analysis, racial stress was entered as the predictor variable (X), racial and ethnic identity was entered as the moderator variable (W), and drug use was entered as the

outcome variable (Y). The regression model indicated that approximately 11% of the variance in the drug use could be accounted for by the model  $R^2 = .11$ ,  $F(6, 189) = 3.70$ ,  $p < .01$ . There was not a significant main effect of racial stress on other drug use ( $B = -.01$ ,  $p = .16$ ). Additionally, the main effect of racial and ethnic identity ( $B = -.03$ ,  $p = .11$ ) and the interaction between racial stress and racial and ethnic identity ( $B = .00$ ,  $p = .06$ ) were not significant; however, the latter is approaching significance. See Table 30.

In the final analysis, racial stress was entered as the predictor variable (X), racial and ethnic identity was entered as the moderator variable (W), and number of sex partners was entered as the outcome variable (Y). Overall, the regression model was not significant  $R^2 = .04$ ,  $F(6, 187) = 1.37$ ,  $p > .05$ . There was not a significant main effect of racial stress on the number of sex partners ( $B = -.09$ ,  $p = .24$ ). Additionally, the main effect of racial and ethnic identity ( $B = -.23$ ,  $p = .16$ ) and the interaction between racial stress and racial and ethnic identity ( $B = .00$ ,  $p = .17$ ) were not significant. See Table 31. Collectively, these results indicate that racial and ethnic identity did not moderate the relationship between racial stress and risky behaviors (e.g., alcohol, marijuana and other drug use and number of sexual partners).

## **Discussion**

Black women experience stressful racist encounters throughout their lives that have psychological and physical repercussions. Using a sample of college-aged Black women, the present study: 1) investigates racial stress and its relationships with internalizing symptoms and poor and risky health behaviors, and 2) investigates the influence of various racial factors, including skin tone, hair texture, and racial identity, on these relationships.

The present study's findings support our hypothesis that participants with higher racial stress levels were more likely to exhibit increased internalizing symptoms. This aligns with established associations between racial stress and anxiety and depression in college-aged minority populations (Torres-Harding et al., 2020). Additionally, research highlights the link between racial stress and hopelessness (Odafe et al., 2017), a key clinical symptom of depression (American Psychiatric Association, 2022). These associations are expected, given the historical context of racial stressors. Racial stressors are pervasive and persistent, remnants of racism embedded in the US societal structure. They can negatively affect racial minorities' experiences with institutions, interpersonal relationships, and their sense of self (Curtis et al., 2023). Minorities experiencing racial stress may endure personal attacks related to their ability, performance, personality, identity, or appearance, yet they have limited to no control over eliminating these stressors.

Additionally, for young Black women, their loss of autonomy and hopelessness are likely compounded when hearing stories of similar racism experiences and related racial stress from their elders (Hankerson et al., 2022). To further complicate matters, despite their limited control

and power, Black women receive unhelpful cultural messages promoting unwavering strength and resiliency via the Strong Black Women (SBW) stereotype (Abrams & Maxwell, 2019; Godbolt & Amutah-Onukagha, 2022). These harsh experiences and unrealistic expectations collectively contribute to the presentation of internalizing symptoms.

This study partially supported our hypothesis that higher levels of racial stress would be associated with poorer weight management behaviors. Specifically, it revealed that participants with higher racial stress levels were less likely to engage in occupational or leisure-related physical activities. This corresponds with findings from other studies showing that high-stressed individuals often lead sedentary lives (Lines et al., 2021; Moore-Greene et al., 2012; Silva et al., 2020).

Black women, who frequently experience intense racial stress, may have limited cognitive resources to prioritize physical activity due to the significant mental burden of coping with these stressors. As previously mentioned, racial stressors are complex and burdensome experiences involving the processing of the actual event, one's emotional response, and others' reactions (Harrell, 2000). Alternatively, Black women may intentionally reduce their exposure to racial stressors by preferring to spend time in the comfort and safety of their homes as opposed to White-majority public spaces such as gyms, parks, and neighborhoods, which they may perceive as unwelcoming, unsafe, or anxiety-provoking (Moore-Greene et al., 2012). Ultimately, this preference may limit their engagement in daily physical activities.

The present study's results did not show evidence of a relationship between racial stress and diet behaviors. Certain aspects of diet behaviors, such as the serving size and frequency of consumption of fruits, vegetables, carbohydrates, meats, fast food, and sweets, as measured by this study, may remain relatively stable among college-age populations (Pelletier & Laska, 2013;

Gonzales et al., 2017) irrespective of racial stressors. For example, studies suggest that diet patterns among college students utilizing university pre-paid meal plans are typically consistent (Brown et al., 2005; Racine et al., 2022). Conversely, college students who do not use prepaid meal plans may face challenges such as limited financial resources, accessibility to grocery stores, and busy class and work schedules, which could discourage drastic changes in their diet regardless of racial stressors. Further, supportive data suggests that marginalized students such as college-aged Black women have less flexibility with their food options due to fewer economic resources (Loofbourrow & Scherr et al., 2023; Rafferty et al., 2023).

This study's results provide limited support for our hypotheses linking racial stress to risky health behaviors. Specifically, our data indicate that higher levels of racial stress are associated with more frequent marijuana use. This finding aligns with previous research identifying high stress as a risk factor for marijuana use (Cavalli & Cservenka, 2021; Weinberger et al., 2019). Additionally, data on Black females shows consistent patterns of marijuana use starting in their early adolescent years and sharply increasing in later adolescence and young adulthood (i.e., ages 18 – 26), the same age group as the present study's sampled population (Miech et al., 2019; Terry-McElrath et al., 2017).

These patterns of marijuana use are likely influenced by the presence of multiple racial stressors during this critical developmental period for college-aged Black women (Mennis & Stahler, 2020). Many young Black women face racial stress that simultaneously impacts their educational and career trajectories, wealth potential, social circles, and dating or marriage prospects (Sanders-Phillips et al., 2009). It's very likely that these racial stressors are anxiety-inducing, which would be consistent with the present study's findings about associations between racial stress and internalizing symptoms.

Furthermore, managing racial stress and internalizing symptoms are challenging, particularly considering the stereotypical boundaries and expectations of behavior for Black women. For example, for many Black women who publicly encounter racial stressors, they may be reluctant to display facial cues, tone, or language associated with anger due to the fear of being perceived as a “loud, angry Black woman” (West, 2018). Similarly, when emotionally struggling, many Black women do not seek support and others may be reluctant to offer support, operating on the belief that she can manage on her own and be resilient, as other Black women have done before her (Abrams et al., 2014). This cyclical pattern of racial experiences, emotional pain, and isolated processing possibly leads many college-aged Black women to resort to marijuana use as a means of coping with their overwhelming yet inescapable reality.

Supportive evidence shows that Black college students use marijuana to cope with distress related to racial discrimination (Martin et al., 2021; Lanaway & Burlew, 2021; Unger & Schwartz, 2021). Furthermore, data indicate that marijuana is the most commonly used illicit substance among all college students, including Black women. Additionally, research highlights that perceptions of marijuana use are more favorable and acceptable in Black communities and to the general public than other drug use (Palamar et al., 2021), which may contribute to the use patterns of college-aged Black women.

This study's findings did not reveal any relationships between racial stress and alcohol consumption (i.e., 5 or more drinks in a row) or hard drug use. Additionally, data also indicate that alcohol and drug use were uncommon behaviors among the sampled population. Therefore, the presence of racial stressors likely did not influence this infrequent behavior.



One explanation for the low alcohol and drug use among the sampled college-aged Black women may be their concern with societal perceptions. Research indicates that many Black individuals hold strong negative views about those who use hard drugs, such as crack cocaine, cocaine, and heroin, due to the negative historical impacts these drugs have had on Black individuals, families, and communities (Godkhindi et al., 2022; Golub et al., 2010). Another study highlights religiosity as a key factor in the disapproval and low use of hard drugs among Black women, suggesting that religious beliefs may serve as a protective factor (Palamar, 2014). Although the present study did not assess religious factors, well-documented evidence outlines the role of faith, predominantly Christian-based faiths, in helping Black women process and cope with racial injustices (Bryant-Davis, & Wong, 2013; Chatters et al., 2008). This is somewhat expected, given that the Christian faith directs one's attention to salvation and eternal life versus towards worldly wrongdoings, which provides psychological advantages (Lewis-Coles, & Constantine, 2006). It's possible that some college-aged Black women rely on their faith rather than external and temporary sources of relief such as drugs.

Additionally, many college-aged Black women may abstain or limit their use of hard drugs due to their educational and career aspirations. Research suggests that Black women are more likely than Black men to pursue higher education and seek professional and advanced degrees (McDaniel et al., 2011). Black women likely pursue education as a pathway to obtain economic stability for themselves and future families (Collins, 2000; Hill, 2005). Therefore, this population may be reluctant to engage in drug use that could disrupt their academic responsibilities, potentially leading to expulsion or revoked scholarships.

Lastly, other studies of college-aged Black women found that important sociocultural factors such as trauma exposure (Evans et al., 2018; Montgomery et al., 2020) and peer influence

(Boyd et al., 2019; Ford & Rigg, 2019) were associated with frequent hard drug use. For these Black women, other trauma exposures likely amplify feelings of hopelessness and loss of control that are also present when experiencing racial stressors. Alternatively, peer support can validate their experiences and buffer their risks. Conversely, peers with weakly developed racial identities and maladaptive coping strategies may create additional psychosocial challenges (Evans et al., 2018; Montgomery et al., 2020).

The present study revealed no relationship between racial stress and the number of sexual partners among our sampled population. One possible explanation for this finding is that the dating and sexual behavior patterns of Black women differ from those of other racial groups (Battle & Carty, 2022; Lanier et al., 2021). Evidence indicates that many Black women often engage in lower-risky sexual behaviors and initiate sexual activities at older ages than other racial and ethnic groups (Decker et al., 2022; Guttmacher Institute; 2022). This contrasts sharply with the societal oversexualization and fetishization of young Black women (Collins & Bilge, 2020; Santoniccolo et al., 2023), which aligns with media stereotypes portraying Black women as promiscuous “Jezebels” (Bryant-Davis & Tinsley-Jones, 2021). Additionally, other studies report that young Black women often face difficulties finding suitable partners who meet their expectations and share interests (Thomas & Hunter, 2023; Wilson & Whaley, 2023). These lived experiences of young Black women, contrasted with societal perceptions, present unique challenges that likely complicate dating and sexual experiences in college (Dogan et al., 2018; Hall & Tanner, 2009; Henry, 2013).

This study’s findings supported our moderation hypothesis related to the influence of skin tone on the effects of racial stress. Specifically, our data suggest that the impact of racial stress on internalizing symptoms increases as skin tone darkens. Studies support that medium and dark

brown-skin Black women face significantly more frequent and intense racism compared to those with lighter skin tones (Godfrey & Taylor, 2022; Hannon et al., 2013; Hunter, 2002). Black women with light brown skin may more closely resemble Eurocentric beauty standards than their darker-skinned counterparts or be perceived as racially ambiguous or mixed-raced (Capodilupo & Kim, 2014; Bryant, 2013). Thus, others may assume that light brown skinned Black women do not fully belong to their racial group, ultimately decreasing the frequency of their prejudice encounters.

Similarly, research shows that medium brown skinned Black women face more discrimination than light brown skinned Black women (Hannon et al., 2013). However, they face less name-calling and ridiculing than dark-brown skinned women as they more relatively resemble whiteness (Godfrey & Taylor, 2022). In sum, light-skinned women followed by brown-skinned women have greater social acceptance, relative to darker-skinned Black women, which may reduce the impact of racism and racial stress encounters and serve as protective factor (Bryant, 2013). Skin tone, however, did not influence the relationships between racial stress and weight management or risky health behaviors. These outcomes may rely heavily on familial, cultural, and environmental influences across various skin complexions.

The present study's findings supported our moderation hypothesis related to the influence of hair texture on the effects of racial stress. Specifically, we found that Black women with looser and curly hair textures showed an increase in the number of sexual partners in response to heightened racial stress. One possible explanation for this is that while all Black women may encounter racial stressors, those with looser and curly hair textures may be perceived as more desirable due to texturism, both within and outside the Black community (Robinson, 2011). Consequently, looser and curly hair textured Black women may have more opportunities for

sexual experiences with various Black partners and partners of other racial and ethnic groups (Hunter, 2007). Hair texture, however, did not influence the relationships between racial stress and internalizing symptoms, weight management, or risky health behaviors. It's possible that the influence of hair texture on the effects of racial stress primarily manifests in interpersonal-oriented behaviors, such as sex, dating, and friendships (Thompson, 2009).

Our study findings did not support any of our moderation hypotheses regarding the influence of racial identity on the effects of racial stress on internalizing symptoms, weight management, or risky health behaviors. One potential explanation for this is the complexity and dynamism of racial identity, particularly among college-aged students who may be receiving new information and exploring concepts related to Black history, Black pride, and Black identities. As previously mentioned, the development of one's racial identity can be a transformative process (Ortega-Williams et al., 2021; Cross & Vandiver, 2017). Cross posits that in their college environment, many Black students experience an increased awareness of race and racism, and that prompts a reevaluation of their racial identity (Encounter Stage). This is followed by a spike in exploration and interest in all things Black, including history, ideologies, culture, campus organizations, and community events. Additionally, there is a longing for connection with other Black individuals and separation from White individuals. This progression may eventually lead to a more balanced understanding of racial identity and sense of self (Immersion-Emersion Stage) (Cross & Vandiver, 2017). Given this dynamic period in college, fixed factors may reveal influences of the examined study effects.

## **Limitations**

The present study is not without limitations. Our study sample is comprised of participants who attended a PWI in the US Midwest. Black women at PWIs likely experience different types and higher levels of racial stress compared to those who attend at an HBCU (Breedon, 2021; Miles, & García, 2018). Similarly, their related internalizing symptoms, and health behaviors may also differ. Black women at HBCUs may have access to supportive resources such as Black peers and professors to help manage and mitigate the effects of racial stress. Furthermore, Black women from PWIs in other regions of the country may respond differently to racial stress. Research suggests that sociocultural factors such as a strong sense of community and Black racial identity (Johnson & Carter, 2020; Keyes, 2009; Loyd, 2024) may be protective factors that promote resilience and healthy well-being in Black young adults.

Secondly, the current study utilizes the SBAS, a two-item assessment, to measure physical activity. This assessment has a few limitations. For example, although the assessment measures physical activity in different aspects of life, including leisure and occupation, having only two items impacts its content and construct validity (Rusticus, 2023). With only two items, the SBAS does not comprehensively assess its specific intended domain or construct- physical activity. Additionally, the SBAS asks participants to indicate statements that best describe their physical activity over the past year. Evidence suggests that physical activity, particularly leisure-related activity, can fluctuate and depend on seasonal factors such as daylight availability and climate conditions (McCormack et al., 2010; Sempere-Rubio et al., 2022). Furthermore, the SBAS response choices combine both frequency and intensity elements, making it difficult to separate and accurately assess distinct aspects of physical activity. Altogether, these assessment limitations can lead to incomplete or biased interpretations of the study findings.

Our study also utilized self-reported measures of skin complexion and hair texture. This method may lead to discrepancies, as participants could inaccurately report their features. Some studies also suggest that one's perceptions of skin tone may be based on a frame of reference of other Black individuals in one's family and community (Averhart & Bigler, 1997; Hunter, 2007). Similarly, others' verbal references to their and others' complexion through the use of colloquiums in the Black community and amongst college students such as redbone, chocolate, and caramel that likely also influences how individuals perceive their skin tone (Carr, 2021; Hunter, 2007; Maxwell et al., 2015). For example, many minorities' first understanding of the categorization of skin tones is often taught by minority family members or peers (Hunter, 2007; Maxwell et al., 2015). This informal racial education is a crucial part of the Black experience as skin color is linked to privilege and discrimination within and outside the Black community. The same "frame of reference" learning may also occur with Black hair texture (Kimbell, 2009; Jackson, 2016).

Alternatively, it is possible that the current age group of our sampled participants (e.g., 18-26) would more accurately self-report such features than older Black women due to recent movements in the beauty industry. For example, makeup brands have significantly expanded their product ranges to better match the diversity of Black skin tones, emphasizing inclusivity (Alli, 2022; Childs, 2022; Werle, 2019). This inclusivity may help consumers more accurately identify their skin complexion. Additionally, since the early 2000s, the Black Natural Hair Movement has increased public awareness and knowledge about caring for curly, kinky, and afro-textured hair (Byrd & Tharps, 2014; Johnson & Bankhead, 2014). This movement also has popularized the alphanumeric hair rating system that was used in this study (Gaines et al., 2023; Krueger et al., 2022; Nkimbeng et al., 2023; Neil & Mbilishaka, 2019; Versey, 2014).

Lastly, our study did not assess participants' involvement in social groups or their perceived social support. Data show that peers are major factors of influence individuals throughout their adolescence, including during college-aged years (Laursen & Veenstra, 2021; Schaefer et al., 2021). Additionally, partner influence is important during this period (Gómez-López et al., 2019; Ritter et al., 2022). For example, individuals with supportive Black peers, partners, or allies may experience a reduced impact of racial stress on their mental health and health behaviors. Conversely, those within friend groups that frequently engage in poor health behaviors (e.g., excessive alcohol consumption, marijuana, and drug use, or multiple sexual partners) may exhibit these behaviors regardless of racial stress. Moreover, such behaviors could intensify under increased racial stress.

### **Clinical Implications**

These results showcase that racial stress does present clear harm to Black women, and some Black women with specific skin complexion and hair textures are more vulnerable than others. Although racism is viewed as a normalized experience for racial and ethnic minorities, resources must be available to identify and manage related stress and its effects. Currently, most racial stress assessments occur within the context of research studies (Carter et al., 2019). However, given the prevalence of racial stress and its established harmful associations, incorporating these assessments into clinical diagnostic evaluations, especially in university counseling centers serving racial and ethnic minorities, could be highly beneficial.

For example, university personnel and clinicians would identify individuals experiencing frequent and severe racial stress and highlight the need for therapeutic support. These supports could assist individuals in navigating their chronic racial stressors, including challenging interpersonal encounters and pervasive feelings of hopelessness that stem from systemic

injustices. However, such conversations would create the need for mental health training programs (e.g., counseling, clinical psychology) to develop curriculums that prioritize increasing trainees' cultural competency and humility. Data suggest that mental health training programs are insufficiently preparing their clinicians to be equipped to address matters related to race, racism, and racial stress (Turner, 2021). Other studies suggest that White clinicians may avoid topics of race and racism with their racial and ethnic minority clients due to fear of appearing offensive and possibly damaging rapport, which ultimately underscores the need for improvements in training programs (King & Borders, 2019; Williams et al., 2018).

It is essential to highlight that avoiding such topics engrained in the experiences of Black young adult likely hurts rapport and possibly discourages the utilization of such services. Furthermore, clinicians who are not comfortable discussing race are likely also not privy to nuances of racial stressors including colorism and texturism.

Nonetheless, providing culturally competent care may also present professional challenges in the coming years, as many state and university policies aim to restrict discussions related to race and racism (Miller-Kleinhenz et al., 2021; Russell-Brown, 2023; Russell-Brown, 2024). It is noteworthy that changes in policy and prohibitions of racial topics could exacerbate racial stress experienced among students by invalidating their lived experiences.

## **Future Directions**

The present study sheds light on multiple areas for future directions of study. Firstly, it investigates general racial stress. Our findings revealed associations between racial stress and internalizing symptoms, physical activity, and marijuana use, as well as the moderating influence of skin tone and hair texture. Future studies should investigate specific types of racial stress, such as individual, cultural, and institutional and evaluate their various impacts on mental health and



health behaviors. Additional data highlighting the types of racial stressors associated with greatest harm would offer valuable information.

Secondly, this study explores racial stress and its effect on mental health and physical health behavior outcomes specifically in college-age Black women. Future research should replicate this study in the next developmental stage for many Black young adult women after college, pregnancy, and postpartum. Current research investigates this critical period for Black women and found they frequently endure racism while receiving perinatal care (Alhalel et al., 2022; Chinn et al., 2021) and specifically reported feeling dismissed and ignored by providers when bringing up pain or medical concerns (Tapp et al., 2020). Such racial stressors during a period known for frequent hormonal fluctuations, drastic body changes, and increased economic demands likely influence related mental health and health behavior outcomes that impact pregnancy, delivery, and recovery. Future studies may provide valuable insights into Black women's experiences, assisting in addressing and combating racial health disparities in perinatal health care.

Lastly, this study was conducted in a Midwestern state in the US, and the sampled population attended a PWI. It is recommended that this study be replicated in other regions of the country and at HBCUs and PWIs to explore potential distinctions in these associations or racial factors that may moderate these effects.

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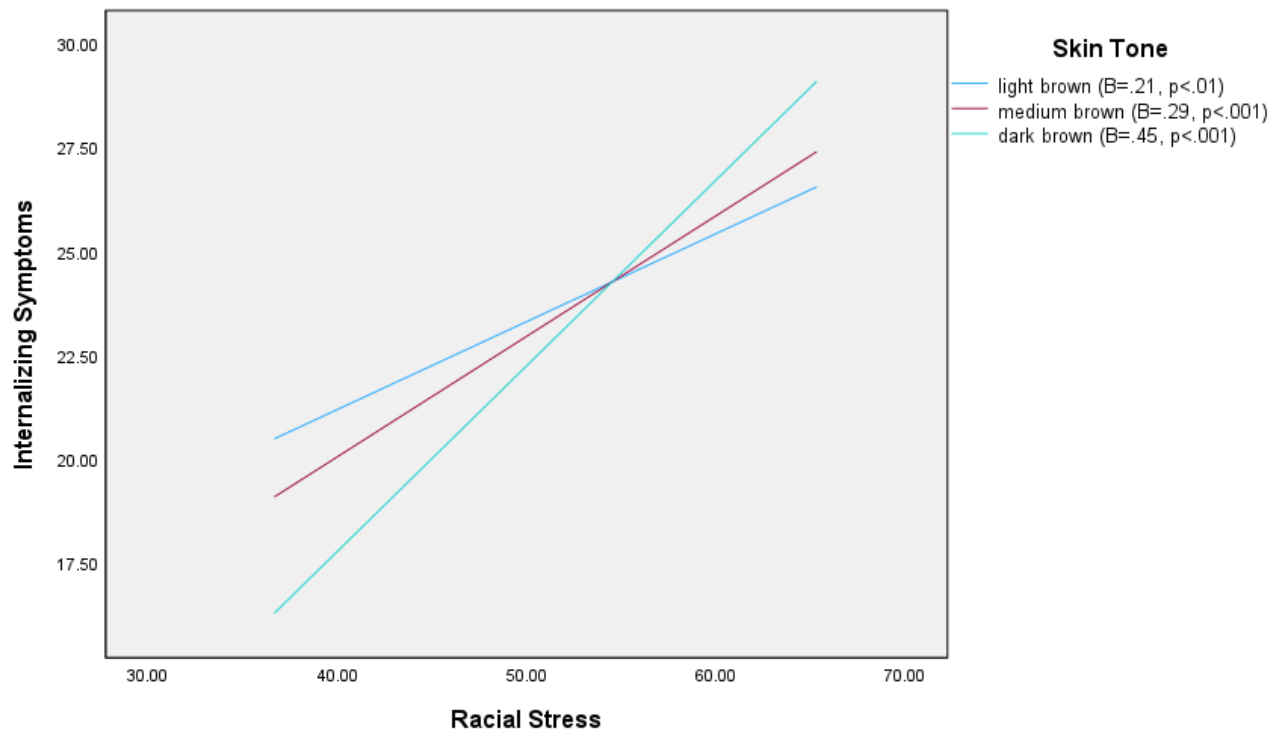
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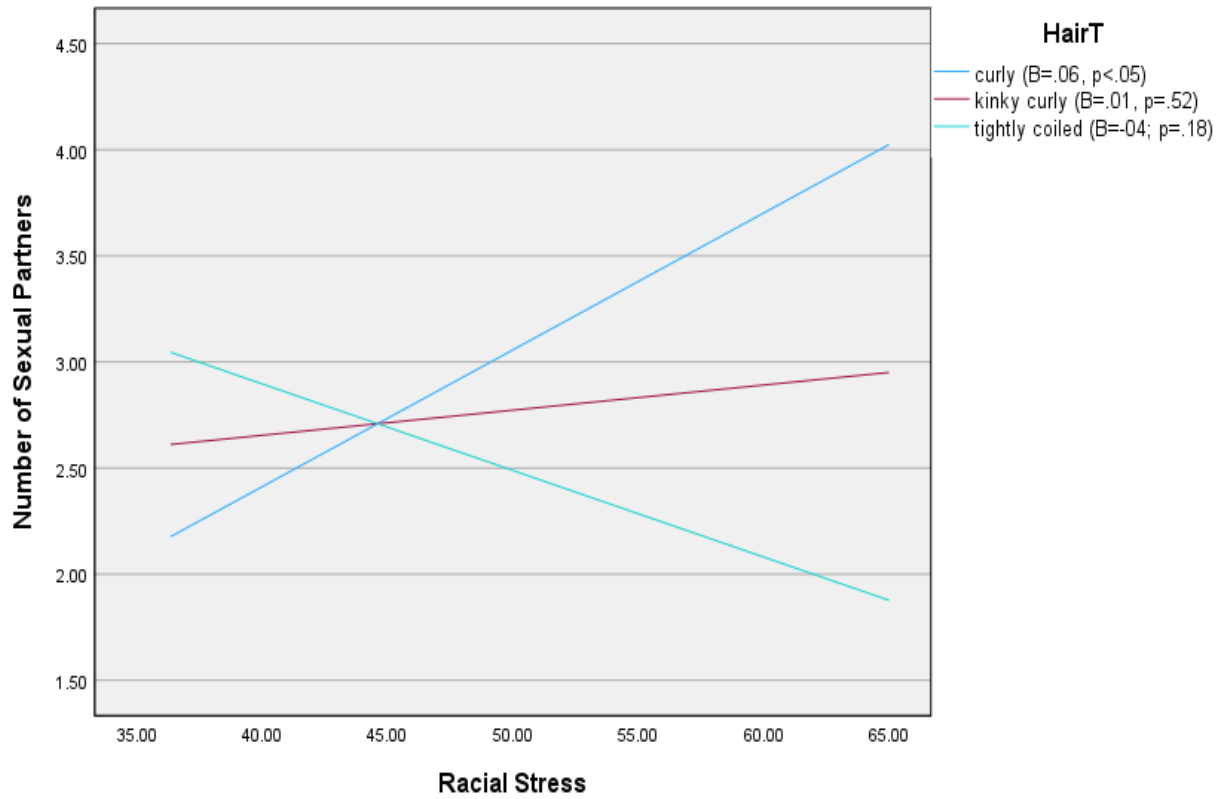
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**Figure 1.** *Simple Slopes Moderation of Skin Tone on Racial Stress and Internalizing Symptoms*



**Figure 2.** *Simple Slopes Moderation of Hair Texture on Racial Stress and Number of Sexual Partners*



**Table 1.** *Participant Demographic Information*

Measure	Item	<i>N</i>	%
Gender	Woman	193	97
	Queer/Non-binary	4	2
	Self-identify	2	1
Race	Black	199	100*
	Biracial or Multiracial	53	26.6*
Ethnicity	Non-Hispanic	195	97.9
	Hispanic	4	2.0
Education	High School/GED	21	10.6
	1 Year College	26	13.1
	2 Year College	41	20.6
	3 Year College	55	27.6
	4 Year College	40	20.1
	Some Grad School	12	6.0
	Master's Degree	4	0
	Doctoral Degree	0	0
	Professional Degree (MD, JD)	0	0
Type of School	Public	168	84.4
	Private	15	7.5
	Other	9	4.5

Detention	0	71	35.7
	1	39	19.6
	2	21	10.6
	3	19	9.5
	4	9	4.5
	5	7	3.5
	6	3	1.5
	7	2	1.0
	10	3	1.5
	25	2	1.0
	30	1	.5
	40	1	.5
	300	1	.5
In-school Suspension	0	160	80.4
	1	13	6.5
	2	7	3.5
	3	5	2.5
	4	3	1.5
	5	1	.5
	15	1	.5
	30	1	.5
Out-of-school Suspension	0	165	82.9
	1	24	12.1



	2	4	2
	3	2	1
	4	1	.5
	5	1	.5
	6	1	.5
	18	1	.5
Expulsions	0	197	99
	1	2	1
Household Structure	Two-Parent	88	44.2
	Single-Parent	88	44.2
	Other	23	11.6
		4	2.0
Mother's Education	Less Than High School		
	High School/GED	44	22.1
	1 Year College	43	21.6
	2 Year College	29	14.6
	3 Year College	40	20.1
	4 Year College	32	16.1
	Some Graduate School	7	3.5
	Master's Degree	0	0
	Doctoral Degree	0	0
	Professional Degree (MD, JD)	0	0
Father's Education	Less Than High School	18	9.0

	High School/GED	72	36.2
	1 Year College	32	16.1
	2 Year College	17	8.5
	3 Year College	29	14.6
	4 Year College	20	10.1
	Some Grad School	3	1.5
	Master's Degree	7	3.5
	Doctoral Degree	0	0
	Professional Degree (MD, JD)	0	0
Family Household Income	Less than \$10,000	13	6.5
	\$10,000-29,999	31	15.6
	\$30,000-49,999	45	22.6
	\$50,000-69,999	42	21.1
	\$70,000-99,999	34	17.1
	\$100,000-149,999	19	9.5
	More than 150,000	13	6.5

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*\*Note.* Percentage totals with asterisks may exceed 100% as race options are not mutually exclusive.

**Table 2.** *Descriptive Information and Bivariate Correlations Among Study Variables*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. IRRS-B Total	--																	
2. Internal Sym.	.34**	--																
3. Physical Act.	-.18*	-.09	--															
4. Diet	-.02	.21**	-.17*	--														
5. Alcohol Use	.14	.20**	-.00	.04	--													
6. Marijuana Use	.20**	.26**	.02	.14*	.27**	--												
7. Drug Use	.11	.14	.11	-.07	.33**	.22**	--											
8. Sex Partners	.06	.09	.06	.07	.28**	.30**	.24**	--										
9. Age	.07	-.03	.01	-.15*	.28**	-.02	.18**	.17*	--									
10. Income	-.05	-.15*	.07	-.04	.06	-.14	-.03	-.05	-.06	--								
11. Education	.13	-.04	.15*	.17*	.16*	-.02	-.03	.13	.66**	.12	--							
12. Mother Edu.	.08	-.03	.11	-.01	.07	-.06	.13	-.03	.02	.54**	.15*	--						
13. Father Edu.	.06	-.06	.07	-.12	.07	-.03	-.01	.02	-.02	.33**	.03	.30**	--					
14. I Suspension	.12	.06	-.03	.12	.01	.05	-.02	-.06	-.07	-.17*	-.08	-.10	-.09	--				
15. O Suspension	.13	.10	-.05	.08	-.05	.11	-.00	-.02	-.04	-.18	-.07	-.10	-.12	.89**	--			
16. Expulsion	-.08	.03	-.04	-.00	.12	.04	.10	.13	.09	-.05	.03	.01	-.08	.06	.01	--		
17. Skin Texture	.03	-.04	.10	-.05	-.07	-.09	-.02	-.03	.02	-.08	.02	-.06	.07	.08	.12	-.05	--	
18. Hair Texture	.06	-.00	-.03	.07	-.16*	.02	.01	-.06	-.08	.06	-.02	.1	.02	.03	.06	-.03	.41**	--
19. Race Identity	.35**	-.01	.11	-.04	-.02	.04	.02	-.01	-.06	.02	.07	.13	.00	.13	.08	-.10	.03	.12
<i>M</i>	50.71	23.18	2.38	1.01	1.31	1.11	2.73	21.13	3.82	4.60	3.91	3.37	.54	.36	.01	4.32	7.97	24.04
<i>SD</i>	15.60	14.78	.97	1.30	1.76	.42	3.98	2.12	1.61	1.47	1.56	1.82	2.54	1.48	.10	1.85	1.56	4.75
Range	79	60	4	5	5	4	21	8	6	6	6	7	30	18	1	9	6	21

Note. IRRS-B = *The Index of Race-Related Stress Brief Version (IRRS-B)*; Internal Sym.= *Internal Symptoms*; Physical Act.= *Physical Activity*; I Suspension= *In-School Suspension*; O Suspension= *Out of School Suspension*. \* $p < .05$ , \*\* $p < .001$

**Table 3.** *Descriptive information for The Index of Race-Related Stress Brief Version (IRRS-B)*

	Mean	SD
1. You notice that crimes committed by White people tend to be romanticized, whereas the same crime committed by a Black person is portrayed as savagery, and the Black person who committed it, as an animal.	3.26	1.07
2. Sales people/ clerks did not say thank you or show other forms of courtesy and respect (e.g., put your things in a bag) when you shopped at some White/non-Black owned businesses.	1.85	1.40
3. You notice that when Black people are killed by the police, the media informs the public of the victims criminal record or negative information in their background, suggesting they got what they deserved.	3.60	.78
4. You have been threatened with physical violence by an individual or group of White/non-Blacks	.91	1.54
5. You have observed that White kids who commit violent crimes are portrayed as "boys being boys," while Black kids who commit similar crimes are wild animals.	3.38	1.00
6. You seldom hear or read anything positive about Black people on radio, TV, in newspapers, or history books.	2.76	1.17
7. While shopping at a store the sales clerk assumed that you couldn't afford certain items (e.g., you were directed toward the items on sale).	1.38	1.64
8. You were the victim of a crime and the police treated you as if you should just accept it as part of being Black.	.51	1.24
9. You were treated with less respect and courtesy than Whites and other non-Blacks while in a store, restaurant, or other business establishment	2.36	1.48
10. You were passed over for an important project although you were more qualified and competent than the White/non-Black person given the task.	1.34	1.62
11. Whites I non-Blacks have stared at you as if you didn't belong in the same place with them; whether it was a restaurant, theater, or other place of business.	2.53	1.30
12. You have observed the police treat White/non-Blacks with more respect and dignity than they do Blacks.	4.29	1.12
13. You have been subjected to racist jokes by Whites/non-Blacks in positions of authority and you did not protest for fear they might have held it against you.	2.10	1.74
14. While shopping at a store, or when attempting to make a purchase, you were ignored as if you were not a serious customer or didn't have any money.	1.46	1.61
15. You have observed situations where other Blacks were treated harshly or unfairly by Whites/non-Blacks due to their race.		

16. You have heard reports of White people/non-Blacks who have committed crimes, and in an effort to cover up their deeds falsely reported that a Blackman was responsible for the crime.	3.21	1.26
17. You notice that the media plays up those stories that cast Blacks in negative ways (child abusers, rapists, muggers, etc.), usually accompanied by a large picture of a Black person looking angry or disturbed	2.94	1.51
18. You have heard racist remarks or comments about Black people spoken with impunity by White public officials or other influential White people.	3.28	.99
19. You have been given more work, or the most undesirable jobs at your place of employment while the White/ non- Black of equal or less seniority and credentials is given less work, and more desirable tasks	3.03	1.32
20. You have heard or seen other Black people express a desire to be White or to have White physical characteristics because they disliked being Black or thought it was ugly	1.27	1.64
21. White people or other non-Blacks have treated you as if you were unintelligent and needed things explained to you slowly or numerous times.	2.70	1.37
22. You were refused an apartment or other housing; you suspect it was because you're Black.	2.27	1.67
<i>Note. IRRS-B Item responses choices were 0 (This never happened to me), 1 (This event happened, but did not bother me) , 2 (This event happened &amp; I was slightly upset), 3 (This event happened &amp; I was upset) and 4 (This event happened &amp; I was extremely upset).</i>	.30	.93

**Table 4.** *Significant Linear Regression Model Predicting Internalizing Symptoms*

Variable	B	SE B	b	t	P
Total Racial Stress	.33	.06	.34	5.12	<.001

R<sup>2</sup>=.12

**Table 5.** *Nonsignificant Linear Regression Model Predicting Diet*

Variables	B	SE B	b	t	P
Total Racial Stress	-.00	.01	-.02	-.30	.77

$R^2=.00$

**Table 6.** *Significant Linear Regression Model Predicting Physical Activity*

Variable	B	SE B	b	t	P
Total Racial Stress	.01	.00	.18	2.50	<.05

$R^2=.03$



**Table 7.** *Nonsignificant Linear Regression Model Predicting Alcohol Use*

Variables	B	SE B	b	t	P
Total Racial Stress	.01	.01	.14	1.92	.056

$R^2=.02$

**Table 8.** *Significant Linear Regression Model Predicting Marijuana Use*

Variable	B	SE B	b	t	P
Total Racial Stress	.02	.01	.20	2.92	<.01

$R^2=.04$

**Table 9.** *Nonsignificant Linear Regression Model Predicting Other Substance Use*

Variable	B	SE B	b	t	P
Total Racial Stress	.00	.00	.11	1.52	.131

$R^2=.01$

**Table 10.** *Nonsignificant Linear Regression Model Predicting Number of Sexual Partners*

Variables	B	SE B	b	t	P
Total Racial Stress	.02	.02	.06	.83	.407

$R^2=.00$

**Table 11.** *Significant Moderation Analysis (Total Racial Stress  $\times$  Skin Tone) Predicting Internalizing Symptoms*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	-.02	.17	-.36 - 67.33
Skin Tone	-4.27*	1.85	-7.92 - .31
Total Racial Stress $\times$ Skin Tone	.08*	.04	.01 - -.62
Age	-.32	.62	-1.54 - .90
Income	-1.18	.62	-2.42 - 1.57
Education	-.24	.92	-2.05 - .05
R <sup>2</sup>	.16		
F	6.09**		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 12.** *Nonsignificant Moderation Analysis (Total Racial Stress  $\times$  Hair Texture) Predicting Internalizing Symptoms*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	.28	.35	-.40 - .96
Skin Tone	-.51	2.16	-4.77 - 3.76
Total Racial Stress $\times$ Hair Texture	.01	.04	-.08 - .09
Age	-.17	.63	-1.41 - 1.07
Income	-1.19	.93	-2.44 - 1.37
Education	-.45	.63	-2.28 - .06
R <sup>2</sup>	.14		
F	5.09***		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 13.** *Nonsignificant Moderation Analysis (Total Racial Stress x Racial and Ethnic Identity) Predicting Internalizing Symptoms*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	.37	.26	-.15 - 61.90
Skin Tone	-.39	.57	-1.50 - .88
Total Racial Stress $\times$ Racial and Ethnic Identity	-.00	.01	-.02 - .73
Age	-.34	.63	-1.57 - .02
Income	-1.23	.63	-2.46 - .89
Education	-.20	.92	-2.02 - .01
R <sup>2</sup>	.15		
F	5.69***		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 14.** *Nonsignificant Moderation Analysis (Total Racial Stress  $\times$  Skin Tone) Predicting Diet*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	-.02	2.57	-.08 - .04
Skin Tone	-.23	.03	-.86 - .40
Total Racial Stress $\times$ Skin Tone	.00	.32	-.01 - .02
Age	-.10	.01	-.31 - .11
Income	-.05	.11	-.27 - .16
Education	-.15	.11	-.46 - .17
R <sup>2</sup>	.03		
F	1.05		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$



**Table 15.** *Nonsignificant Moderation Analysis (Total Racial Stress  $\times$  Skin Tone) Predicting Physical Activity*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	.01	.01	-.01 - .04
Skin Tone	.08	.13	-.18 - .33
Total Racial Stress $\times$ Skin Tone	-.00	.00	-.01 - .00
Age	-.06	.04	-.14 - .03
Income	.04	.04	-.05 - .13
Education	.13	.06	-.00 - .25
R <sup>2</sup>	.07		
F	2.28*		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 16.** *Nonsignificant Moderation Analysis (Total Racial Stress x Hair Texture) Predicting Diet*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	.06	.06	-.06 - .17
Skin Tone	.45	.37	-.27 - 1.18
Total Racial Stress $\times$ Hair Texture	-.01	.01	-.02 - .01
Age	-.10	.11	-.31 - .11
Income	-.05	.11	-.26 - .16
Education	-.17	.16	-.48 - .14
R <sup>2</sup>	.04		
F	1.25		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 17.** *Nonsignificant Moderation Analysis (Total Racial Stress  $\times$  Hair Texture) Predicting Physical Activity*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	-.00	.02	-.05 - 6.06
Skin Tone	-.11	.15	-.41 - .04
Total Racial Stress $\times$ Hair Texture	.00	.00	-.00 - .19
Age	-.06	.04	-.15
Income	.04	.04	-.05
Education	.13*	.06	.01
R <sup>2</sup>	.06		
F	2.13		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 18.** *Nonsignificant Moderation Analysis (Total Racial Stress x Racial and Ethnic Identity) Predicting Diet*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	.02	.05	-.07 - .10
Skin Tone	.01	.10	-.18
Total Racial Stress $\times$ Racial and Ethnic Identity	-.00	.00	-.00
Age	-.10	.11	-.31
Income	-.05	.11	-.27
Education	-.14	.16	-.46
R <sup>2</sup>	.03		
F	1.00		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 19.** *Nonsignificant Moderation Analysis (Total Racial Stress x Racial/Ethnic Identity) Predicting Physical Activity*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	.00	.02	-.03 - .04
Skin Tone	-.01	.04	-.09 - .07
Total Racial Stress $\times$ Racial and Ethnic Identity	.00	.00	-.00 - .00
Income	.04	.04	.01 - .24
Education	.12	.06	-.05 - .13
R <sup>2</sup>	.06		
F	2.02		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 20.** *Nonsignificant Moderation Analysis (Total Racial Stress x Skin Tone) Predicting Alcohol Use*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	-.01	.02	-.04 - .02
Skin Tone	-.31	.17	-.64 - .03
Total Racial Stress $\times$ Skin Tone	.01	.00	-.00 - .01
Age	.20***	.06	.09 - .31
Income	.08	.06	-.03 - .19
Education	-.08	.08	-.24 - .08
R <sup>2</sup>	.12		
F	4.35***		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 21.** *Nonsignificant Moderation Analysis (Total Racial Stress  $\times$  Skin Tone) Predicting Marijuana Use*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	.04	.02	.00 - .09
Skin Tone	.11	.23	-.35 - .56
Total Racial Stress $\times$ Skin Tone	-.00	.00	-.01 - .00
Age	-.01	.08	-.16 - .14
Income	-.15	.08	-.31
Education	-.05	.12	-.28
R <sup>2</sup>	.08		
F	2.75*		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 22.** *Nonsignificant Moderation Analysis (Total Racial Stress x Racial/Ethnic Identity) Predicting Physical Activity*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	.01	.01	.00 - .02
Skin Tone	.08	.05	-.00 - .21
Total Racial Stress $\times$ Racial and Ethnic Identity	-.00	.00	-.00 - -.00
Age	.08*	.02	.04 - 1.11
Income	.01	.02	-.14 - -.04
Education	-.09*	.02	-.03 - .04
R <sup>2</sup>	.02		
F	1.57**		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$



**Table 23.** *Nonsignificant Moderation Analysis (Total Racial Stress x Skin Tone) Predicting Number of Sexual Partners*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	.10	.05	.00 - .20
Skin Tone	.86	.54	-.19 - 1.92
Total Racial Stress $\times$ Skin Tone	-.02	.01	-.04 - .00
Age	.31	.18	-.05 - .66
Income	-.15	.18	-.51
Education	.03	.27	-.50
R <sup>2</sup>	.05		
F	1.78		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 24.** *Nonsignificant Moderation Analysis (Total Racial Stress x Hair Texture) Predicting Alcohol Use*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	-.02	.03	-.08 - .04
Skin Tone	-.31	.19	-.69 - .07
Total Racial Stress $\times$ Racial and Ethnic Identity	.00	.00	-.00 - .01
Age	.20***	.06	.09 - .31
Income	.08	.06	-.03
Education	-.08	.08	-.25
R <sup>2</sup>	.13		
F	4.70***		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 25.** *Nonsignificant Moderation Analysis (Total Racial Stress x Hair Texture) Predicting Marijuana Use*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	.03	.04	-.06 - .12
Skin Tone	.06	.27	-.48
Total Racial Stress $\times$ Hair Texture	-.00	.01	-.01
Age	-.02	.08	-.18
Income	-.14	.08	-.29
Education	-.04	.12	-.27
R <sup>2</sup>	.06		
F	2.04		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 26.** *Nonsignificant Moderation Analysis (Total Racial Stress  $\times$  Hair Texture) Predicting Drug Use*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	.02	.01	-.00 - .04
Skin Tone	.09	.06	-.04 - .22
Total Racial Stress $\times$ Hair Texture	-.00	.00	-.00 - .00
Age	.07**	.02	.03 - .11
Income	.01	.02	-.03 - .05
Education	-.09**	.03	-.14 - -.03
R <sup>2</sup>	.10		
F	3.44**		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 27.** *Nonsignificant Moderation Analysis (Total Racial Stress  $\times$  Hair Texture) Predicting Number of Sexual Partners*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	.22	.10	.03 - .42
Skin Tone	1.17	.63	-.06 - 2.41
Total Racial Stress $\times$ Hair Texture	-.03*	.01	-.05 - -.00
Age	.23	.18	-.13 - .58
Income	-.10	.18	-.46
Education	.04	.26	-.48
R <sup>2</sup>	.06		
F	1.93		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 28.** *Nonsignificant Moderation Analysis (Total Racial Stress x Racial/Ethnic Identity) Predicting Alcohol Use*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	-.01	.02	-.06 - .03
Skin Tone	-.07	.05	-.17 - .04
Total Racial Stress $\times$ Racial and Ethnic Identity	.00	.00	-.00 - .00
Age	.20***	.06	.09 - .31
Income	.08	.06	-.03 - .20
Education	-.10	.08	-.26 - .06
R <sup>2</sup>	.11		
F	3.99***		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 29.** *Nonsignificant Moderation Analysis (Total Racial Stress x Racial/Ethnic Identity) Predicting Marijuana Use*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	-.01	.03	-.08 - .05
Skin Tone	-.09	.07	-.23 - .05
Total Racial Stress $\times$ Racial and Ethnic Identity	.00	.00	-.00 - .00
Age	-.03	.08	-.19 - .13
Income	-.14	.08	-.30 - .01
Education	-.03	.12	-.26 - .20
R <sup>2</sup>	.07		
F	2.31*		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 30.** *Nonsignificant Moderation Analysis (Total Racial Stress  $\times$  Racial/Ethnic Identity) Predicting Drug Use*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	-.01	.01	-.03 - .00
Skin Tone	-.03	.02	-.06 - .01
Total Racial Stress $\times$ Racial and Ethnic Identity	.00	.00	.00 - .00
Age	.07**	.02	.04 - .11
Income	.01	.02	-.03 - .04
Education	-.09**	.03	-.14 - -.03
R <sup>2</sup>	.11		
F	3.70**		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$



**Table 31.** *Nonsignificant Moderation Analysis (Total Racial Stress x Racial/Ethnic Identity) Predicting Number of Sexual Partners*

Variable	$\beta$	B (SE)	95% CI
Total Racial Stress	-.09	.08	-.25 - .06
Skin Tone	-.23	.17	-.56 - .09
Total Racial Stress $\times$ Racial and Ethnic Identity	.00	.00	-.00 - .01
Age	.26	.18	-.10 - .61
Income	-.12	.18	-.48 - .24
Education	.06	.27	-.47 - .59
R <sup>2</sup>	.04		
F	1.37		

*Note.* B = unstandardized coefficient; SE = standard error.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Table 32.** Total, Direct, and Conditional Effects of Racial Stress and Skin Tone on Internalizing Symptoms

	$\beta$	SE	$t$	$p$	95% CI
Total Effects	-.02	.02	-1.28	.21	-.05 - .01
Direct Effects	-.02	.14	-.14	.89	-.29 - .25
Conditional Effects					
Light Brown Skin Tone	.21	.08	2.63	.01	.05 - .37
Medium Brown Skin Tone	.29	.08	3.87	.00	.14 - .44
Dark Brown Skin Tone	.45	.08	5.63	.00	.29 - .61

*Note.*  $B$  = unstandardized coefficient;  $SE$  = standard error.

**Table 33.** Total, Direct, and Conditional Effects of Racial Stress and Hair Texture on Number of Sexual Partners

Variable	$\beta$	SE	$t$	$p$	95% CI
Total Effects	.22	.10	2.20	.03	.02 - .41
Direct Effects	.28	.13	2.22	.03	.04 - .53
Conditional Effects					
Curly Hair Texture	.06	.03	2.14	.03	.00 - .12
Kinky-Curly Hair Texture	.01	.03	.36	.72	-.04 - .06
Tightly-Coiled Hair Texture	-.04	.03	-1.43	.16	-.10 - .02

*Note.*  $B$  = unstandardized coefficient;  $SE$  = standard error.

## Appendix A. Skin Tone Measurement



## Appendix B: Hair Texture Typing Measurement

