

GENDER AND RACIAL IDENTITY, NORMATIVE PERCEPTIONS OF PHYSICAL  
ACTIVITY, AND PHYSICAL ACTIVITY AMONG COLLEGE-AGED AFRICAN  
AMERICAN WOMEN

By

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African American women have a compounded risk for chronic disease development, poorer disease-related quality of life, and chronic disease mortality. While regular engagement in physical activity can reduce these risks, African American women are significantly less likely to engage in physical activity when compared to their gender and racial counterparts. Therefore, it is important to identify factors that may contribute to physical activity and protect against physical inactivity among African American women. Social Identity Theory may offer a framework for understanding gender and racial influences on exercise behaviors.

Social Identity Theory posits that individuals strengthen their sense of belonging with social groups by adopting normative perceptions, attitudes, values, and behaviors. Prior research has established associations between gender and racial identity and exercise behaviors as well as associations between normative perceptions of physical activity and exercise behavior.

Inferences from prior research suggests there is a link between gender and racial identity and normative perceptions of exercise behavior, however this link has not been established. Female gender seems to be a risk factor for physical inactivity across the developmental continuum,

however research examining African American cultural influences on physical activity has yielded mixed findings.

This dissertation sought to examine gender and racial influences on exercise behavior in a sample of African American college-aged women guided by the Social Identity theoretical framework. More specifically, this study sought to (1) comprehensively measure gender and racial identity domains and compare strengths of identity across these two domains, (2) examine perceived physical activity norms for gender and race, (3) determine whether gender and racial identity predict physical activity, (4) determine whether gender and race-related physical activity norms predict physical activity, and (5) examine links between gender identity and gender-related physical activity norms and links between racial identity and race-related physical activity norms.

A total of 188 African American undergraduate women completed an online survey that assessed multiple dimensions of gender and racial identity, normative perceptions of physical activity for gender and race, and exercise behaviors. On average, participants reported strong emotional and psychological connection to other women and African Americans. They also reported strong, positive feelings towards being women and African American. Lastly, participants reported that physical activity was normative for their female friends, African American friends, and normative for broader reference groups of women in general and African Americans in general. Overall, physical activity was perceived by participants to be more normative for African Americans than for women and more normative for broader reference groups of women and African Americans as compared to female and African American friend groups.

In terms of predicting physical activity, the full model of Social Identity Theory was not supported for either gender or racial influences; however, results indicated that both positive African American racial identity and perceiving physical activity as normative for one's African Americans friends were positive influences on exercise behaviors. Compared to racial identity, gender identity did not predict physical activity, but positive female gender identity was linked to perceiving exercise as more normative for one's female friends, establishing what appears to be the first empirical link between identity and norms in the social identity theory literature. Clinical implications of these findings and future directions for research are discussed, particularly as it relates to increasing and sustaining motivation for exercise among African American Women.



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AMERICAN WOMEN

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by

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## **DEDICATION**

This dissertation is dedicated to the memory of my beloved parents and grandmother. To my mother, who instilled ambition and sparked desire to pursue my doctoral studies. To my father, for teaching me the true meaning of determination and instilling in me perseverance and resilience. Lastly, to my grandmother, for teaching me to be genuine in all that I do. Without your unconditional love and support I would not have become the person I am today. Although you are no longer of this world, your words of wisdom and your heavenly guidance will continue to carry me forward.

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## LIST OF ABBREVIATIONS

AA	African American
AAW	African American Women
EA	European American
EAW	European American Women
LTPA	Leisure Time Physical Activity
PA	Physical Activity
SIT	Social Identity Theory

## **CHAPTER I: INTRODUCTION AND LITERATURE REVIEW**

A significant proportion of United States (US) adults do not engage in the amount of physical activity (PA) recommended by the U.S Department of Health and Human Services' [USDHHS]. Current PA guidelines established by DHHS in 2008 recommend that adults engage in at least 150 minutes of moderate-intensity aerobic PA, or 75 minutes of vigorous-intensity aerobic PA per week, in addition to performing muscle-strengthening activities two or more days per week (USDHHS, 2018). In 2017, only 24.4% of US adults met leisure-time physical activity (LTPA) guidelines (Blackwell & Villarroel, 2018). Therefore, 75.6% of US adults were physically inactive.

Physical inactivity is a significant health problem for African American Women (AAW) specifically. In 2017, 59.6% of AAW did not meet PA guidelines (Blackwell & Villarroel, 2018). Moreover, rates have been relatively consistent over time and higher than their racial and gendered counterparts (Blackwell & Villarroel, 2016a, 2016b, 2017, 2018). Physical inactivity among AAW is concerning because it increases risk for chronic disease development and poor disease management, due, in part to increased risk for obesity, hypertension (HTN) and high cholesterol (i.e., high concentrations of low-density lipoprotein (LDL); USDHHS, 2018), conditions that are disproportionately prevalent among AAW. To inoculate against chronic disease development and mortality, it is important to understand factors that contribute to PA and protect against a sedentary lifestyle within this population. Social Identity Theory (SIT) provides a framework for examining how identity and normative perceptions of behaviors may impact PA among AAW.

The Social Identity Theory (SIT), proposed by Tajfel and Turner (1979), posits that individuals simultaneously strengthen their sense of self and their sense of belonging with an in-group by adopting attitudes, values, and behaviors that are prototypical (i.e., normative) of the in-group. Several studies have established relationships between identity (i.e., exercise identity, identification with peer groups), normative perceptions, and engagement in PA, inclusive of LTPA and sport (Stevens, Rees, Coffee, Steffens, Haslam & Polman, 2017; Hamilton & White, 2008; Ries, Hein, Pihu, & Armenta, 2012; Terry & Hogg, 1996), suggesting the model is applicable to health promoting and health compromising behaviors.

SIT may help to explain sociocultural influences in health behavior, particularly gender and racial influences. Gender and race are important self-defining markers of identity and may also be important influential factors consider for exercise behaviors. Feminine gender identity and normative perceptions of PA for women are linked to reduced engagement in PA (Bąk-Sosnowska, Urban & Gruszczyńska, 2018; Covey and & Feltz, 1991; Davison, Schmalz & Downs, 2010; Duin et al., 2015; Jun & Kyle, 2012; Lantz, & Schroeder, 1999; Steinbach, Green, Datta, & Edwards, 2011). While an extensive body of literature suggests that feminine gender identity and normative perceptions of PA for women may serve as a possible risk factor for physical inactivity, research examining African American (AA) racial identity and race-related PA norms for AA's have inconsistent findings. Some dimensions of AA/Black Identity are associated with increased engagement in PA while others negatively impact activity levels, particularly among samples of AAW (Cogbill, Sanders Thompson, & Deshpande, 2011; Hardy, Corte, Finnegan, Kim, Matthews, & Wilbur, 2011; Lewis, Boutrin, Dalrymple, & McNeill, 2018). Similarly, some studies suggest that sport and PA may be a normative behavior for AA's (Harrison, L., Harrison, C. K., & Moore, 2002), while others suggest that PA may not be a

culturally relevant behavior for AA's (Henderson & Ainsworth, 2003; Steinbach, Green, Datta, & Edwards, 2011). Therefore, it is possible that AA racial identity, and normative perceptions of PA for AA's may serve as a risk or protective factor for PA among AAW.

Taken together, these studies suggest that gender and racial identity, normative perceptions of PA for gender and race may be relevant for understanding engagement in PA for AAW. Further exploration of how gender and racial identity can influence this health behavior is important for health promotion efforts, particularly in strengthening PA interventions for AAW who are at higher risk for chronic disease incidence, mortality, and poor quality of life secondary to sedentary lifestyles.

Guided by SIT, the purpose of this study is to (1) comprehensively measure gender and racial identity in a sample of AAW (2) examine the degree to which AAW perceive PA to be normative for their gender and race, (3) determine whether gender and racial identity predict engagement in PA within a college-age sample of AAW (4) examine whether normative perceptions of PA for gender and race predict engagement in PA within a college sample of AAW, and (5) examine whether gender and racial identity predict normative perceptions of PA within a college-aged sample of AAW.

### **Biological and Physiological Risk for Disease Development among AAW**

Women and AA's have independent biological and physiological factors that contribute to differences in chronic disease susceptibility. For example, women's estrogen production helps to maintain levels of low-density lipoprotein (LDL) and delay disease onset, however estrogen's protective function may fade after menopause (Petrovska, Dejanova, Manchevska, & Gligorova, 2018). There are also racial differences in LDL enzyme activity and lipoprotein biology. LDL particles tend to be smaller in AA's when compared to EA's (Gaillard & Osei, 2016) which

results in a prolonged retention time in circulation and increased likelihood that particles will become trapped in the arterial wall, therefore increasing risk for vascular blockage (Feingold & Grunfeld, 2018). Racial differences in enzyme activity may be due, in part, to higher rates of obesity and HTN, conditions that are disproportionately prevalent among AAW and are also contributors to disease development (Blackwell & Villarroel, 2017; McIntosh, Kumar, Kalynych, Lott, Hsi, Chang, & Lerman, 2013). Taken together, the combination of these factors suggest that there may be a compound, “double jeopardy” effect for disease development, mortality, and poor quality of life for AAW (Ferraro, 1987). In sum, physical inactivity combined with biological and physiological pre-dispositions may put AAW at greater risk for disease development and disease mortality.

### **Social Identity Theory**

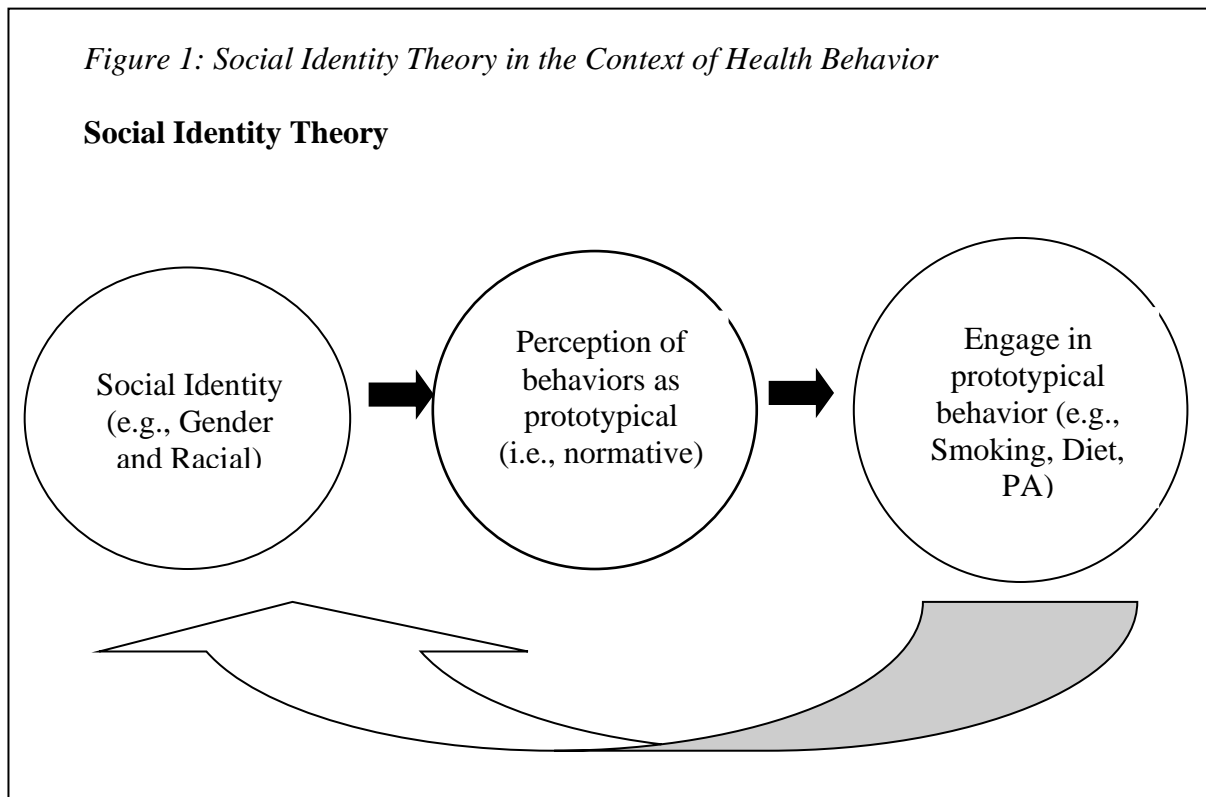
Social identity theory (SIT; Tajfel & Turner, 1979) examines the role of group identity, group-behavior, and intergroup relationships in self-concept. Social identification is defined as (1) the process by which individuals locate themselves or another person within a system of social categorizations, (2) any social categorization used by a person to define himself, herself, or others, and/or (3) the process by which an individual internalizes some form of social categorization such that it becomes part of an individual’s self-concept (Tajfel, 1979). Tajfel and Turner (1979) suggest that first, individuals decide which social categorizations are most important (e.g., gender, race, religion, peer). Then, given awareness of shared characteristics of in-group members and awareness of characteristics that distinguish them from out-group members, individuals refer to other group members to determine feelings, attitudes, values, and behaviors that are prototypical for the group.

The self-categorization theory is a sub-theory of SIT which suggests that individuals may internalize and conform to feelings, attitudes, and values, and engage in behaviors consistent with prototypes (i.e., models for expected in-group behaviors) in efforts to enhance their social identity, sense of belonging, and sense of cohesiveness with group members (Hogg, & Turner, 1987). Therefore, it is likely that group membership is associated with an increased sense of pride, self-esteem, emotional well-being, and a secure sense of self. Additionally, SIT posits that social categorization, related normative perceptions, behaviors are linked and may be especially important for predicting behavior.

### **Health Behavior within the context of SIT**

SIT may help to provide a culturally-driven explanation as to why individuals engage in health-promoting and/or health-compromising behaviors in addition to several other factors that have been commonly identified in the literature (e.g., self-efficacy, time constraints, inconvenience). More specifically, in applying SIT to health behaviors, it is likely that individuals who identify with a social group may perceive that certain health behaviors are prototypical or less prototypical (i.e., normative, or less normative) for the group. In turn, individuals who identify with a social group may then engage in health promoting behaviors or health compromising behaviors if the behaviors are perceived as prototypical of the in-group. The broader goal of engaging in behaviors perceived as identity-congruent is to enhance their sense of belonging and self-concept. Notably, given the way SIT is described, prototypes may be created using perceptions of actual behaviors that are practiced by members of a social group (i.e., descriptive, or behavioral norms; Cialdini, Reno, and Kallgren, 1990), or they may be created by inferring what behaviors are appropriate or acceptable by other members of the in-group (i.e., injunctive, or attitudinal norms; Cialdini, Reno, and Kallgren, 1990). While it is

important to distinguish between descriptive and injunctive norms, they both may co-occur (Blanton, Köblitz, & McCaul, 2008). Moreover, given the way that SIT is described, descriptive and injunctive norms serve the same function within a SIT framework and conforming to either descriptive or injunctive norms may result in similar behavior. The idea that SIT is applicable to health behaviors is supported in research suggesting identification can influence motivation to engage in health promoting or health-compromising behaviors (Oyserman, Fryberg & Yoder, 2007). A visual representation of SIT in the context of health behavior is shown in Figure 1.



*Note: Figure adapted from Thornton (2018).*

Components of SIT have been used to explain engagement in health-promoting and health compromising behaviors based on the reasoning that health behaviors can be viewed as prototypical in-group behaviors. Additionally, several social and cultural groups have been used

as in-group reference groups. For example, within a theory of planned behavior (TPB) framework, peer identification and normative eating perceptions for peers influence eating habits among adolescents in that normative perceptions of peers' eating habits influenced intention to eat healthy when peer identification was made salient (Åstrøm & Rise, 2001), and overestimating peer's unhealthy snack intake and approval of snack food intake were associated with adolescents' unhealthy snack food intake (Lally, Bartle, & Wardle, 2011). Devine, Sobal, Bisogni, and Connors (1999) also identified that food selection and consumption was driven by ethnic/racial identification and ethnic/racial traditions within AA and Latino populations.

In addition to eating behaviors, an extensive body of literature shows that components of SIT have also been used to explain smoking and substance use behaviors. For example, adolescents conform to perceived peer and gendered smoking norms and use smoking to facilitate gender-based social belonging and enhance popularity (Fry, Grogan, Gough, & Connor, 2008; Lennon, Gallois, & Owen, 2004; Mermelstein, 1999; Plumridge, Fitzgerald, Abel, & McDermott, 2002; Schofield, Pattison, Hill, & Borland, 2001, 2003; Stewart-Knox, Sittlington, Rugkåsa, Harrison, Treacy, & Abaunza, 2005). Associations between gender and racial identification and smoking/substance use behaviors have also been established (Fry, Grogan, Gough, & Connor, 2008; Holley, Kulis, Marsiglia, & Kieth, 2006; Kong, Camenga, Cavallo, Connell, Pflieger, & Krishnan-Sarin, 2012; Kulis Marsiglia, & Hecht, 2002; Mermelstein, 1999). Additionally, normative perceptions of smoking for gender and race predict smoking behavior among AAW (Thornton, 2018).

In addition to smoking, substance use, and eating behaviors, components of SIT have been used to explain PA engagement. For example, Stevens, Rees, Coffee, Steffens, Haslam, and Polman (2017), argue that (1) identifying with groups that view exercise as a normative behavior

for the group may help to increase PA, (2) people may be more interested in PA if it can foster connection with other members of a salient social group or with others with shared physical characteristics, (3) perceived cohesiveness within formed exercise groups can help to increase adherence to an exercise regimen, and (4) social group leaders may have a positive role in shaping/increasing exercise behaviors if there is a shared sense of identity among group members.

Regarding the SIT components, exercise identity and normative perceptions for those who engage in PA were identified as additional variables that are important for predicting intention to engage in PA among adolescents (Hamilton & White, 2008; Ries, Hein, Pihu, & Armenta, 2012), college-aged students (de Bruijn & van den Putte, 2012), and college employees (Jackson, Smith, and Conner, 2003). Terry and Hogg (1996) also suggest that normative perceptions of important referent groups, such as friends and peers, can influence intention to engage in PA among adolescents, but only for those who strongly identify with their friends and peers (Terry & Hogg, 1996). In sum, it seems that a SIT framework may be beneficial for understanding identity, and norms-based motivation for engagement in (or lack of) PA however various studies examining SIT components have primarily focused on peer identification, and the adoption of an exercise and/or athletic identity, rather than examining how other social categorizations may play a role in PA SIT might aid in understanding social and cultural influences in PA, particularly the ways in which gender and racial identity influence normative gendered and race perceptions of PA, and in turn may influence engagement in PA among AAW. The sections below will review the current literature on advancements in gender and racial identity conceptualization and measurement. The sections below will also describe relationships among identity, PA norms, and engagement in PA while highlighting various

methodological limitations regarding sample characteristics and gender and racial identification measurement.

### **Conceptualization of Gender Identity and Measurement**

Gender Identity is defined as a person's deeply-felt, inherent sense of being a boy, a man, or male; a girl, a woman, or female; or an alternative gender (e.g., genderqueer, gender nonconforming, gender neutral) that may or may not correspond to a person's sex assigned at birth or to a person's primary or secondary sex characteristics (American Psychological Association [APA], 2015a). Recent definitions of gender identity have also considered that gender identity may involve a combination of social/environmental and biological factors (APA, 2015b). While more recent definitions suggest that gender is internally defined, complex, and contingent on cultural/social/environmental upbringing, gender was previously conceptualized as a dichotomous construct with mutually exclusive attitudes, feelings and behaviors for men and women (Bem, 1974).

Early measures of gender identity were based on the limited conceptualizations of gender identity at that time. As a result, early measures only examined self- endorsement of traditional masculine and feminine characteristics, behaviors, attitudes, and gender roles (Bem 1974; O'Heron & Orlofsky, 1990; Spence, Helmreich, & Stapp, 1975). For example, traditional characteristics for males, included being independent, confident, outspoken, and athletic, while traditional feminine traits included being nurturing, emotionally expressive, and empathic. Several measures have assessed gender identity in this format including Bem's Sex Role Inventory (BSRI; Bem, 1974), The Personal Attitudes Questionnaire (PAQ; Spence, Helmreich, & Stapp, 1975), the Attitudes towards Women Scale (AWS; Spence & Helmreich, 1978), the

Attitudes towards Marital and Child Rearing Roles (AMCR; Hoffman & Kloska, 1995), and Stockard-Johnson's Measure of Gender Differences (Gill, Stockard-Johnson, & Williams, 1987).

This approach, using traditional masculine and feminine traits as the sole means to assess gender identity, has several limitations. First, gender trait binaries may not account for additional forms of gender expression (e.g., genderqueer, gender nonconforming, gender neutral). Second, traits, attitudes, and behaviors are not mutually exclusive to dichotomous gender categories, and third, individuals may not be aware that traits, attitudes, and behaviors are sex-typed. With these limitations in mind individuals may (1) endorse traits that are consistent with the opposite gender (Palan, Areni, & Kieker, 1999), and/or (2) this may lead to undifferentiated and/or androgynous profiles (Bem, 1974; Blanchard & Freund, 1983). In sum, measures that rely on endorsement of traditional gendered traits do not reflect current conceptualizations of gender and may not be an accurate indicator of how one may evaluate themselves in light of their gender (Egan & Perry, 2000). The previously stated limitations may be pertinent in measuring gender identity among AAW as there is literature to suggest that AAW are balanced in regard to endorsement of feminine and masculine traits and AAW perceive themselves to be less typical of women (Binion, 1990; DeLeon, 1993; Harris, 1996; Thornton, 2018).

Several multi-dimensional models of gender identity have been developed in order to address the limitations mentioned above. These newer models account for internal experiences and evaluative judgements of gender (Egan & Perry, 2001; Tobin, Menon, Menon, Spatta, Hodges, & Perry, 2010). For example, Egan & Perry (2001) include constructs to (1) assess the degree to which an individual views themselves as similar to, or different from, other group members (i.e., gender felt- typicality) and (2) examine the degree to which individuals feel pressured to adhere to stereotypical gender roles and behaviors (i.e., gender felt- conformity). In

a three-factor model, Cameron (2004) suggests that gender identity measurement should examine (1) whether individuals hold positive or negative views of in-group members (i.e., in-group affect), (2) degree of importance of a given group identity to the individual (i.e., centrality), and (3) emotional connection one has with in-group members (i.e., in-group ties). Notably, factors in Cameron's three-factor model are not specific to any identity domain and therefore could be applied to other social identity categories (e.g., gender, race, religion, etc.). In sum, it is clear that multi-dimensional measurements of gender identity have strengths that make it a more optimal method of measuring gender identity, primarily in that they capture an individual's internal sense of themselves in respect to gender identity.

### **Gender Identity and Engagement in PA**

Several descriptive and quantitative studies have established links between gender identity and engagement in PA among adolescent populations. More specifically, masculine gender identity has been linked to increased engagement in PA, while the opposite is true of feminine identity. In a review paper, Spencer, Rehman, and Kirk (2015) found that adolescent girls restrict PA to avoid appearing less feminine/more masculine. In another study, Covey and Feltz (1991) examined associations between past and present PA levels and gender identity among 149 adolescent girls ( $M_{age}$  of 16.42) in a predominately EA high school. Gender identity in Covey and Feltz's (1991) study was assessed using traditional gendered traits with the BSRI (Bem, 1974). Findings indicated that adolescent women in the physically active group were categorized as androgynous (i.e., high in both masculine and feminine traits on the BSRI), when compared to physically inactive students. Results from these studies suggest that masculine identity is linked to engagement in PA among adolescents, while feminine identity may be linked to reduced engagement in PA. Consistent with SIT, findings from the aforementioned studies

suggest that gender identity can influence PA levels among youth and adolescents. More specifically, feminine identity may be predictive of lower engagement in PA.

Quantitative and qualitative research examining gender identity and PA levels among adults show similar findings as those reported in youth and adolescent literature described above. For example, Jun and Kyle (2012) examined associations between gender identity, leisure identity, and leisure participation in golf in predominately male samples of 485 middle-aged adults (63% male sample, mean age of 49.9 and 40.8 across two groups). Similar to studies described earlier, gender identity was measured using a combination of traditional gendered traits in this study. Results showed that leisure participation was positively predicted by masculine identity for men, in that as masculine identity became more salient, participants' level of golf participation increased. Additionally, masculine identity had a positive indirect effect on leisure participation via leisure identity for both women and men. Notably, feminine identity was not a direct or indirect predictor of golf participation in the study (Jun & Kyle, 2012). Consistent with SIT, results from this study suggest that masculine identity may be predictive of increased engagement in PA among men and women, however, the same cannot be said for feminine identity.

In a more recent mixed-methods study, Duin and colleagues (2015) examined PA levels among 400 adult men and women. Survey data revealed that women were significantly less active than men in the sample. Duin and colleagues (2015) conducted further qualitative analysis to identify contributors to gender disparities in PA among 134 females varying from adolescent to middle adult ages. The authors identified that women's role as caregivers was a significant barrier to engaging in PA. A Japanese woman stated, "[...], you know it's very important that you wait on your husband, the kids, you come last, which left little time or energy for physical

activity”. Another woman whose racial/ethnic make-up was not reported stated, “We’re busy taking care of others rather than ourselves and the physical exercise comes as an aside.” Shaw and Henderson (2000) also posit that women who define themselves in terms of traditional feminine gender traits and behaviors (e.g., ability to be nurturing and caregiving) have various barriers that restrict engagement in PA. Taken together, these quotes suggest that women who prioritize aspects of traditional, sex-typed traits and behaviors, may be less likely to engage in PA.

There is research to suggest that gender identity may function in a similar way among college-aged adults specifically. Colley, Roberts, and Chipps (1985) found that both male and female sports participants were higher in traditional masculinity traits among 156 undergraduate men and women between the ages of 18 to 29 ( $M_{age}$  of 19.45) as assessed using the BSRI. This finding could be interpreted as PA levels are greater among women who do not prioritize traditional feminine traits. Similarly, Richman and Shaffer (2000) found that masculine identity was significantly positively correlated with pre-college sport participation among women within a predominately European American (EA; 85%) sample of composed of 220 undergraduate women ranging from age 18 to 24 ( $M_{age}$  of 19.65), while femininity was not. Gender identity in Richman and Shaffer’s (2000) study was assessed using the PAQ. Henderson, Stalnaker and Taylor (1988) examined associations between traditional gendered traits (measured using the BSRI) and barriers to PA among 125 adult students (undergraduate and graduate), faculty and staff, between the ages of 18 and 66 in university setting. Notably, the majority of the sample consisted of undergraduate and graduate students (i.e., 58%). Women with profiles categorized by higher feminine traits reported that decision-making (e.g., not being able to plan recreation, or not knowing how to use leisure time), and low interest (e.g., boredom, social unease) in LTPA

were among barriers in engaging in PA. In contrast, women categorized by more traditionally masculine traits (i.e., masculine, and androgynous profiles) did not perceive these barriers. Given these results, it is possible that there is a negative association between traditional gender identity traits and behaviors and exercise behavior for women. More specifically, women who endorse only traditional feminine behaviors may be less likely to prioritize PA, may have difficulty planning LTPA, and in turn, they may be less likely to engage in LTPA. It is important to highlight that endorsement of traditional gender traits parallel felt-gender typicality, only one of the identity dimensions that was described in research by Egan & Perry, 2001, which is not consistent with current conceptualizations of gender identity measurement.

In another study, Lantz and Schroeder (1999) examined associations between masculine and feminine gender roles and athletic identity among 409 college athletes and non-athletes. The sample primarily consisted of women (57%), EA's (93%), and non-athletes (72%). Women were overrepresented in the non-athletic group (i.e., 63 %). Results showed that (1) athletic identity was significantly positively related to masculinity and significantly negatively related to femininity among women and men in the sample, (2) athletic identity was significantly negatively associated to femininity among athletes and nonathletes and significantly positively associated with masculine identity among athletes, and (3) men reported higher levels of athletic identity than those who categorized as undifferentiated or feminine. Results of this study indicate that athletes/high athletic identifiers, who are more likely to engage in sport and exercise activity, maintained greater identification with masculine gender roles as compared to non-athletes/low athletic identifiers. Consistent with SIT, results from adult and college-aged adult studies suggest that gender identity influences PA patterns. More specifically, traditional masculine identity

traits may be linked to engagement in PA, while the opposite is true of traditional feminine identity traits.

Gender identity also seems to play a role in types of activities chosen for exercise and can impact exercise intensity. For example, Bąk-Sosnowska, Urban, Gruszczyńska (2018) examined associations between gender identity, as measured using the BSRI, and engagement in different forms of PA among 112 EAW who were grouped by PA preferences. The mean ages of women who only engaged in Yoga was 34.10, and the mean ages of women who participated in other types of PA was 32.10. Results indicated that women who only engaged in Yoga, a light intensity workout, endorsed more feminine traits. In contrast, more women who engaged in moderate to high intensity workouts such as aerobic exercise, and strength and conditioning workouts were categorized as androgynous, undetermined or masculine. In sum, consistent with SIT, these results may suggest that identity can influence PA patterns. More specifically, women who perceive themselves as more male-like may pursue more strengths-based or high intensity-based workouts, whereas those who endorse more traditionally feminine traits, may be more likely to engage in lower intensity workouts and, in turn, may have difficulty meeting recommended guidelines for PA.

In sum, in review of findings in youth and adult literature, it seems plausible that there is a negative association between gender identity, as assessed using traditional gendered traits, and behaviors, and PA among women. More specifically, as women endorse more traditional feminine traits, they may be less likely to engage in PA. Endorsement of traditional gendered traits and behaviors parallels felt-gender typicality, an identity dimension that was described earlier (Egan & Perry, 2001). Findings in the previously mentioned studies conducted among

youth and adults are consistent with SIT in that they suggest that gender identity may influence engagement in health behaviors such as PA.

While literature suggests that there are associations between gender identity and PA patterns, several limitations are worth mentioning. First, many of the studies have used a unidimensional form of measurement to assess gender identity using traditional gender traits that seem to parallel felt-gender typicality in Egan and Perry's (2001) research. However, as described earlier, gender identity is inclusive of multiple dimensions. Therefore, it is not clear how other dimensions of gender identity may be associated with PA engagement. Second, a significant number of studies have focused on sport engagement. Therefore, it is unclear how this may apply to leisure time PA patterns of non-athlete women. Lastly, AAW were not adequately represented in many of the previously mentioned studies so it is not clear how results may generalize to samples of AAW. Given that there is literature to suggest that AAW are balanced in regard to endorsement of feminine and masculine traits and AAW perceive themselves to be less typical of women (Binion, 1990; DeLeon, 1993; Harris, 1996; Thornton, 2018), it is possible that an androgynous presentation may be predictive of increased PA in samples of AAW, however, further exploration of gender identity and its' effect on PA engagement with more comprehensive measurement is warranted.

### **Normative Perceptions of PA for Women and Engagement in PA**

An extensive body of literature has established connections between gender-related perceptions of PA and PA patterns in childhood and adolescence, particularly in the form of gender stereotypes. More specifically, different forms of sport and physical education are perceived to be unfeminine. For example, in a mixed-methods study, Schmalz and Kerstetter (2006) examined awareness of gendered perceptions of sport and exercise in a youth sample

predominately composed of EA's and girls ( $M_{age}$  of 9). Results from quantitative analysis showed a tendency for boys and girls to engage in activities they categorized as most appropriate for their respective genders (i.e., more girls engaged in activities such as cheerleading, dance, and ballet, while boys engaged in football and wrestling). When adolescents were asked to explain the reasoning behind their categorizations, one adolescent boy stated he categorized football and baseball as masculine sports "Because in football sometimes you can tackle and in wrestling you can kind of hurt them, and in baseball you get to run a lot. You throw baseballs and you get to hit them." Another adolescent boy stated football and baseball were categorized as male sports because " [he didn't] think girls want[ed] to get knocked down and stuff". These quotes indicate there are gender appropriate behaviors associated with sports, as they made assumptions about what boys and girls should like and how they should behave. Davison, Schmalz & Downs (2010) examined factors that contributed to decline in PA in EA adolescent girls, as measured by the Girls Decline in Physical Activity Scale (G-DAS). The sample consisted of 151 girls who were assessed at age 13 ( $M_{age}$  of 13.33), and 109 who were reassessed at age 15 ( $M_{age}$  of 15.34). Gender identity, composed of items that assessed gendered perceptions of girls' engagement in PA (e.g., "girls who do them are too competitive", girls who do them are too aggressive", and "boys and girls will think I'm a tomboy), had a marginal influence on PA level decline among girls in the study. In a qualitative study by Martínez-Andrés, Bartolomé-Gutiérrez, Rodríguez-Martín, Pardo-Guijarro, & Martínez-Vizcaíno (2017), gendered perceptions of behavior contributed to lower engagement in PA for 22 adolescent girls between the ages of 8 and 11 in Spain, as girls were more likely to role-play and talk during recess instead of playing active, competitive games, suggesting that PA may not be an appropriate behavior for girls. Consistent with SIT, results of the studies above might suggest that injunctive perceptions

of PA may influence PA patterns. More specifically, PA may be perceived as less appropriate for adolescent girls, and in turn girls may be less likely to engage in PA.

Normative perceptions of PA may operate in a similar fashion among adults. As described earlier, Henderson, Stalnaker and Taylor (1988) found that low interest in PA and difficulty planning and using leisure time were significant barriers to PA for adult women in a university setting. Henderson (1990) posits that women feel they are undeserving of leisure time due to gender role obligations, and this is a common reason why women have difficulty planning and using leisure time. Henderson's (1990) findings may help to explain difficulties with planning active leisure time. In another study conducted by Duin and colleagues (2015) described earlier, women who ranged in ages provided responses that indicated that gendered norms associated with PA were significant barriers to PA engagement. One woman stated, "You go to the gym and the majority of the people are men. You go to the park and the people walking their dogs are men." Results from this study suggests that women may perceive that PA is reserved for men. Moreover, PA and sport may be perceived to less normative for women and in turn, women may be less likely to engage in sport/PA. This may be especially true of women who strongly identify with feminine identity (Shaw & Henderson, 2005; Henderson, Stalnaker, & Taylor, 1988). Consistent with SIT, several studies suggest that normative perceptions, particularly injunctive perceptions of PA and sport can influence engagement in PA for girls and women. There may be some uncertainty regarding what is driving the internalization of normative perceptions of PA for women, however, it is possible that gender identification may be a significant contributing factor among women.

While an extensive body of literature has established associations between normative perceptions of PA for gender and PA engagement, there is one noteworthy limitation. Similar to

a limitation in studies establishing associations between gender identity and PA engagement, samples have consisted predominately of EAW participants, therefore it is not clear how AAW may view PA in light of gender. Further research examining gendered-perceptions of PA and their effect on PA engagement with samples inclusive of AAW is warranted.

### **Gender Identity and Normative Perceptions of PA**

Studies specifically examining associations between gender identity and normative perceptions of PA are scarce however, inferences can be made from literature examining associations between gender identity and engagement in PA, and literature examining associations between normative perceptions of PA and engagement in physical activity. Spencer, Rehman, and Kirk (2015) found that adolescent girls restrict PA to avoid appearing less feminine. In Davison, Schmalz & Downs's (2010) study, items that made up the G-DAS (e.g., "girls who do [sports] are too competitive", girls who do [sports] are too aggressive", and "boys and girls will think I'm a tomboy) reflect characteristics that are perceived to be masculine and normative for boys. Lastly, in qualitative research by With-Nielsen and Pfister (2011) conducted among 16- and 17-year-old girls, two Muslim girls perceived that another girls' involvement in sport was driven by a desire to "become a boy". Results from these studies suggest that adolescent girls and boys were aware of gender-based normative perceptions of sport and PA. Consistent with SIT, it is speculated that adolescent boys and girls were aware of gendered sports and PA perceptions because their gender identity was an important part of their self-concept, however, the specific role that gender identification may play in influencing normative perceptions of is understudied among adolescents.

In regard to adult studies, low interest in PA and difficulty planning leisure time were barriers in engaging in PA for adult women in a university setting (Henderson, Stalnaker, &

Taylor, 1988), possibly due to traditional gender role obligations (Duin et al, 2015; Henderson 1990). Taken together, findings from Henderson, Stalnaker, and Taylor's (1988) study, Henderson (1990), and Duin and colleagues (2015) might suggest women may be less likely to engage in PA, because PA is not perceived as an appropriate, or normative behavior for women, and this may be particularly true of women who strongly identify with feminine gender. Similar to research in adolescent studies, the link between gender identification and normative perceptions of PA is understudied.

In sum, consistent with SIT, inferences from the studies above suggest that there may be a relationship between gender identity and injunctive normative perceptions of PA engagement. More specifically, it may be inferred that having a strong feminine identity may be associated with less acceptability, and possibly anti-normative perceptions of PA for women.

While it can be inferred that there are associations between gender identity and gender-related PA norms in both adolescents and adults, support has mostly come from studies that are qualitative in nature and studies that have only examined injunctive normative influence, not descriptive behavioral norms. Furthermore, studies have not explicitly examined components of gender identification and how these components relate to gender-related PA norms. Lastly, inferences are drawn from studies that have not specifically focused on AAW. Future research examining the identity-norms link in SIT with quantitative measurement would help to (1) add support to existing studies that have examined gender identity influences in PA and (2) examine whether identity predicts normative perceptions of PA among AAW.

### **Summary of Literature Examining Gender Identity, PA Norms, and PA**

Existing literature links gender identity and PA, normative perceptions of PA for gender and PA levels, and there is preliminary support for links between gender identity and normative

perceptions of PA for gender. In sum, consistent with a full SIT model, it is possible that women who strongly identify with their gender may be less likely to engage in PA because it may not be perceived as a normative behavior for women.

### **Conceptualization of Racial Identity and Measurement**

Race is derived from shared physical attributes (Quintana, 2005; Cokley, 2007; Krogman as cited in Helms, 1990). For example, Krogman (as cited in Helms, 1990) defines race as “a sub-group of people possessing a definite combination of physical characteristics, of genetic origin, from other sub-groups of mankind”. In contrast to race, ethnicity refers to the categorization of a group of people who perceive themselves as having shared ancestry, history, customs, language, beliefs, values, and etc. (Casas, 1984; Cokley, 2007; Phinney, 1990). While researchers use the term “ethnic-racial or racial-ethnic identity” as a meta-construct in the identity literature, “racial identity” will be used in this dissertation to refer to both racial and ethnic identity for AA/Blacks.

Several models contribute to current conceptualizations of AA/Black identity. These models include Social Development, Africentricism, Affiliation-Commitment, and/or Multidimensional (Sullivan & Esmail, 2012). Core tenants of each model and measures that are associated with the models are discussed below:

**Social development models and related measures.** Social development models of African American/Black identity suggest that AA’s/Blacks acquire a sense of self as they progress through various stages. One of the most popular and influential models of racial identity within development for AA’s/Blacks is Cross’s Model of Nigrescence (1971). Cross’s (1971) model suggests that Black identity is developed as individuals progress through four stages: pre-encounter, encounter, immersion/emersion, internalization, and

internalization/commitment. Each stage is categorized by shifts in racial salience and racial self-concept. Moreover, shifts in racial salience and self-concept are associated with advancement in feelings, thoughts, and behaviors toward other AA's/Blacks and EA's/Whites. The first stage is the pre-encounter stage. The general theme of the pre-encounter stage is that there is simultaneous idolization of white culture and rejection of membership within Black culture (i.e., Anti-Black/Pro-White profile). This stage is characterized by low racial salience and/or neutral to strong negative feelings and thoughts about being black, likely due to internalized negative stereotypical views of blacks that are held by Whites in dominant society. The second stage, Encounter, serves as a bridge between pre-encounter and immersion/emmersion. In this stage, African Americans/Blacks have experiences (e.g., racism, discrimination) which force them to modify their worldview. In turn, AA/Black racial identity is made more salient, and individuals begin to question their positive attitudes towards whites and negative attitudes towards blacks. The Third Stage, Immersion/Emmersion, is initially characterized by strong identification with black culture (i.e., immersion) coupled with demonization of white (and other) cultures (i.e., Pro-Black, Anti-White Profile). However, towards the end of this stage, there is an emergence (i.e., emmersion) of the view that strong Black Identification does not require demonization of other racial groups. Internalization is the fourth stage, which is categorized by an appreciation of ones' own (Black) racial identity. Pro-black attitudes become less defensive, though attitudes towards other Blacks and Whites may be more neutral after acknowledging positives and negative attributes of all races (Cross, 1971; 1978).

Measures that asses racial identity development using a social development framework either (1) seek to describe where AA's/Blacks are in regard to their stage of development, or (2) assess the degree to which AA's/Blacks possess stage-congruent attitudes. Measures that are

associated with the social development framework of racial identity development include Cross's Racial Identity Scale (CRIS; Vandiver, Cross, Worrell, Fhagen-Smith, 2002), the Racial Identity Attitudes Scale (RIAS; Helms & Parham, 1990), and the Black Identity Classification Scale (Resnicow et al., 2009).

**Africentric models and related measures.** Africentric-based models of development assume that AA's/Blacks possess values and attitudes that are characteristic of traditional African cultures. Eight core components of Africentrism have been identified in the literature and are assumed to be part of a healthy AA/Black personality: (1) Spirituality (i.e., belief in a power greater/higher than the self), (2) Communalism/Collectivism (i.e., desire to prioritize the needs of the family/group over the needs of the individual/self), (3) Harmony and Balance (i.e., a desire to find balance between all of elements of life), (4) Time as a social phenomenon (i.e., Time exists as a social consequence of social interaction), (5) Affective Sensitivity (i.e., awareness of other's feelings), (6) Expressive Communication (i.e., placing emphasis on communication using words and/or abstract means, such as art or music), (7) Multidimensional Perception & Verve (i.e., the ability to learn using multiple modalities, particularly rhythm and motion), and (8) Negativity to Positivity (i.e., the ability to find positives in negative situations (Sullivan & Esmail, 2012).

Measures that assess racial identity using an Africentric framework assess the degree to which African Americans/Blacks embody various components of an Africentric worldview. Some measures that are associated with the Africentric framework include the African Self-Consciousness Scale (ASCS; Baldwin & Bell, 1985), and the Black Personality Questionnaire (BPQ; Williams, 1981)

**Affiliation-Commitment models and related measures.** Affiliation-Commitment models suggest that racial identification is best understood by examining one's connection with their racial in-group and examining exploration/involvement with in-group activities and traditions. The Multi-Group Ethnic Identity Measure (MEIM; 1990; 1992) is a measure that was created with affiliation-commitment models in mind. The MEIM assesses identification, engagement in ethnic traditions and social activities, positive and negative evaluation towards members of a shared ethnic group, connection and pride, and finding a sense of clarity and a secure sense of self (Phinney, 1990; 1992). Marcia (1980) also has a two-factor measure which assesses exploration (i.e., tendency to actively seek for information to better understand one's own ethnicity), and commitment (i.e., adopting life values that are consistent with one's ethnic group and having a strong attachment and affirmation of one's ethnic group).

**Multidimensional models and summary of racial identity conceptualization and measurement.** Based on the current state of the literature, racial identity may be best conceptualized using a multi-dimensional framework. While measures may be organized based on core tenants, (1) there are multiple points of convergence across the various models and measures previously described, and (2) various measures complement each other and include items that reflect core tenants of other conceptual models. For example, the Multidimensional Racial Identity Scale (MRIS) measures AA/Black Racial Identity parameters, inclusive of items that assess acceptance and comfort with physical attributes of AA's (i.e., physical), concern, commitment, and pride in AA's (i.e., psychological), awareness and commitment to the resolution of social, economic and political issues that affect AA's (sociopolitical), and awareness and comfort with language, art, literature, and social traditions in the AA community (i.e., cultural). The MRIS may be primarily categorized as a multi-dimensional model, but it is

clear that social development, afri-centric, and affiliation-commitment conceptualizations are reflected within each dimension.

While the labels of components may vary between measures, current racial identity models suggest that it is important to examine four key elements (1) identity salience and importance (i.e., is racial identity an important aspect of self-concept), (2) emotional valence (i.e., positive, negative, or neutral feelings towards others in their racial-in group), (3) sense of connection with respective racial in-group, and (4) affiliation (i.e., adopting values and participating in customs and traditions perceived as typical of respective racial in- groups). In sum, racial importance, emotional valence, connection and pride, and engagement/participation are common across multiple models and measures of racial identity. This suggests the importance of examining associations of these aspects of racial identity to PA for AAW.

### **Racial Identity and Engagement in PA**

Several studies suggest that AA/Black racial identity can influence PA levels. For example, in a review paper, Harrison, L., Harrison, C. K., and Moore (2002) posit that AA's /Blacks in the immersion phase of the immersion-emersion stage of Cross's Model may seek to participate in sports and other PA's as a means to fully engage in activities that are perceived representative of Blackness. This may be particularly true of AA males (Harrison, L., Harrison, C. K., & Moore, 2002). Notably, findings that AA's may cling to activities that seem representative of AA/Black culture parallels, racial felt-typicality, a dimension described in Egan and Perry's (2001) research.

In another study by Siegel, Yancey, and McCarthy (2000), higher ethnic identity scores, measured using an adaptation of the Ethnic Identity Assessment Scale, was associated with engagement in LTPA among 429 AAW who were 18 and older. While the racial identity

measure used in this study was not multi-dimensional, the measure included items that were similar to emotional valence, racial pride, racial importance, and racial connection (i.e., “I have a lot of pride in blacks and our accomplishments, “I prefer to socialize with other blacks”). These items parallel racial centrality, racial in-group affect, and racial in-group ties, three dimensions proposed in research by Egan and Perry (2001), and Cameron (2004), and further suggest that these dimensions may positively impact engagement in PA among AAW.

In another study, Johnson (2002) found that the internalization stage of racial identity development, characterized by security and pride in being Black (Cross, 1971), positively predicted health promoting behaviors within a sample of 224 AA adults ( $M_{age}$  of 37.2). Johnson (2002) used the Stages Questionnaire (Cross, 1972) to determine level of racial identity development, and total scores on the Health-Promoting Lifestyle Profile II (HPLPII) to examine health behaviors (i.e., health responsibility, PA, nutrition, spiritual growth, interpersonal relations and stress management). These results suggest that there may be a positive association between racial salience and positive racial regard and engagement in various health-promoting behaviors, such that when AA/Black identity is more important and as AA's/Blacks have strong positive feelings about being AA/Black, they may be more likely to engage in positive health behaviors like PA.

Research by Armstrong (2013) also suggests that racial identity may positively impact PA levels. Armstrong (2013) examined predictors of PA among 123 AAW between the ages of 18 and 64. The sample was primarily composed of college-aged participants (i.e., 18-24-year-olds made up approximately 45% of the sample). Results showed that in addition to psychological stimulation and educational attainment, racial identity was a significant predictor of PA, such that as racial identity became increasingly important to AAW's self-concept, they

were more likely they were to engage in PA. Notably, a single item was used to assess racial identity in this study, and it parallels racial centrality, a racial identity dimension discussed in Cameron's (2004) research. Similar to findings in studies mentioned above, results might suggest that racial centrality may positively impact engagement in PA among AAW.

In another study, Smalley, Warren, McClendon, Peacock, and Caro (2016) found that a high degree of ethnic identity, as measured by the MEIM, was predictive of increased motivation to engage in exercise among 154 middle-aged AAW ( $M_{age}$  of 50.97), such that with every point increase on the MEIM, participants were 2.6 times more likely to be in the action stage of change or higher for exercise behavior. The MEIM is inclusive of dimensions that reflect engagement in ethnic activities, sense of connection, and emotional valence, which parallel racial felt-typicality, racial in-group ties, and racial in-group affect respectively. Results suggest that racial felt-typicality, racial in-group ties, and racial in-group affect may be predictive of PA. Similarly, Lewis, Boutrin, Dalrymple, and McNeill (2018) found positive associations between public racial regard (i.e., how respondents feel other groups view blacks) and PA levels within a predominately female (76%) sample of 1268 Black adults ( $M_{age}$  of 47.8). More specifically, perceiving that others have positive feelings about blacks was associated with moderate and high PA levels. Notably, centrality was not associated with PA levels. Results from this study suggest that high emotional valence may be predictive of increased engagement in PA levels among AA's, AAW specifically.

Lastly, in a study conducted by Cogbill, Sanders, Thompson, and Deshpande (2011) high collectivism (i.e., prioritization of the group over the individual) was associated with meeting PA recommendations among 446 AA men and women between the ages of 45 and 75. Moreover, results of multivariate analysis indicated that high collectivism was associated with meeting PA

recommendations among men, while high collectivism paired with high religiosity were associated with meeting PA guidelines among women. In the previous study, collectivism was measured using selected items from the ASCS (Baldwin, & Bell, 1985).

While the studies described above suggest that components of racial identity may be predictive of engagement in PA for AA's research by Hardy (2012) contradict these findings. Hardy (2012) examined whether racial identity stages influence PA engagement within a sample of 252 AAW between the ages of 40 and 65. Racial identity in this study was assessed using the Black Identity Classification Scale (BICS; Resnicow, 2009). Results indicated that Black American Identity, characterized by a high racial salience and high degree of connection to other Black Americans and Black American culture was a significant predictor of PA in that, as race became more salient and important, AAW were less likely to engage in PA. Racial salience and importance mirror racial centrality, a racial identity dimension proposed in Cameron's (2004) research. These findings conflict with findings in studies mentioned previously, as racial centrality seems to be predictive of lower engagement in PA levels among AAW.

Findings in qualitative research also seem to conflict with findings in previous studies. Airhihenbuwa, Kumanyika, Agurs, and Lowe (1995) examined perceptions about exercise, rest, and health among AA's across a range of ages (i.e., ages 12 to 65 and older). They concluded that EA's emphasis on individualism may be a strong motivator for PA. In contrast to individualism, collectivism is highly prioritized in AA/Black culture, and this may contribute to lower levels of PA in AA/Black populations. Conclusions drawn from research conducted by Airhihenbuwa, Kumanyika, Agurs, and Lowe (1995) are in direct conflict with findings in research conducted by Cogbill, Sanders, Thompson, and Deshpande (2011).

Taken together, a review of studies examining associations between AA/Black racial identity and PA show inconclusive findings. Some studies suggest that AA/Black racial identity dimensions are predictive of increased engagement in PA while others suggest that dimensions of AA/Black identity are predictive of lower levels of PA. A strength of studies examining associations between AA/Black racial identity and PA is that they have established that these associations exist within samples of AAW. While sample selection is a strength there are various measurement limitations. It is clear that AA/Black racial identity is multi-dimensional and best assessed using components from various conceptual models, however (1) some studies have only examined one aspect associated with AA/Black racial identity, (2) some have utilized multi-dimensional measures, but similar components were not used across studies, and (3) some studies used all-inclusive measures. Therefore, it may be difficult to determine the relative influences of each AA/Black racial identity component. Another limitation is that several quantitative studies mentioned have primarily focused on middle or older adult AAW. Given the results of the studies that were previously mentioned, it seems likely that AA/Black racial identity dimensions can have a differential effect on PA engagement among AAW, however additional research is warranted to address the aforementioned limitations (i.e., uni-component measurement, non-use of similar components, and all-inclusive measurement).

### **Normative Perceptions of PA for AA's/Blacks and Engagement in PA**

Several studies suggest that PA may be perceived as a normative behavior for AA's. An extensive body of literature suggests that AA's/Blacks are stereotyped for being more athletic and have a natural affinity for sports, such that athleticism and AA/Black identity are perceived to be indistinguishable from one another (Bimper & Harrison, 2011; Harrison, L., Harrison, C. K., & Moore, 2002; Stone, Lynch, Sjomeling, & Darley, 1999). Moreover, some forms of PA

and sport may be more normative for AA's/Blacks which in turn, can influence participation in specific activities. For example, Harrison L., Harrison, C. K., and Moore (2002) suggests sports or physical activities perceived as AA/Black-appropriate (i.e., basketball, football, and track) can increase participation in sport and PA among AA youth. Results of Harrison, L., Harrison, C. K., and Moore (2002) suggest that behaviors can be perceived as appropriate (or not appropriate) and in turn, may directly influence PA levels. These studies suggest that normative perceptions, particularly injunctive perceptions of PA and sport, may influence PA levels among AA adults.

In a qualitative study, Swierad, Vartanian, & King (2017) examined cultural and mainstream influences in diet and PA among 25 AA adults. While age was not reported, the majority of participants were recruited from a university setting. One participant stated “[...] eating more fruits and vegetables [...] it's probably more from mainstream American culture, and then more of a focus on athleticism as a woman comes from my African American culture”. This quote suggests that this AAW perceived that athleticism was an aspect of AA/Black culture, and in turn was a motivator for her to be more athletic (and engage in PA).

While several studies examining sport and PA among AA's/Blacks may suggest that PA and sport may be perceived as an aspect of AA/Black culture, other studies suggest that the opposite may be true. For example, in a qualitative study described above, Airhihenbuwa, Kumanyika, Agurs, & Lowe (1995) examined perceptions about exercise, rest, and health among AA's in a qualitative study across a range of ages (i.e., 12 to 65+). One participant stated, “culturally the reason why blacks don't exercise as much as they do is because we haven't been exercising, we have other things to be concerned about”. Additionally, a common theme identified in participants' responses indicated that rest was more important than exercise for AA's. Specific occupations or degree of occupational-related physical assertion was not

reported, but many AA's felt that their daily work activities were a form of physical exercise such that they did not need to engage in additional structured moderate to vigorous PA outside of work or other daily activities. Similarly, in another study conducted by Henderson and Ainsworth (2003) one AAW said stated that she did not know any adults who engaged in LTPA because they were always working. Additionally, the AAW in this study related PA to a history of physical work. Given the quotes it can be argued that hard physical labor has been adopted as part of AA/Black culture. In turn, additional physical exertion from structured exercise may be perceived as less normative for AA/Black culture.

Other studies show that PA may not be perceived as a normative behavior for AA's. In a series of studies, Oyserman, Fryberg, and Yoder (2007) examined whether health promoting behaviors were perceived as characteristic of EA and/or respective various racial-ethnic minority culture among a sample of college-students. Results of the first study relevant to normative perceptions of PA for AAW was conducted among undergraduates (Study 1 in the article) and indicated that in comparison to EA's, racial-ethnic minorities were (1) less likely to engage in health promoting behaviors, and (2) more likely to perceive that health-promoting behaviors were characteristic of middle-class EA's. Results of the second study that was relevant to normative perceptions of PA conducted among undergraduates (Study 2 in the article) indicated that racial-ethnic minority students were significantly less likely to perceive that positive health behaviors were consistent with their respective racial-ethnic minority cultures. Lastly, results of the third study that was relevant to normative perceptions of PA for AAW conducted among AA undergraduates ( $M_{age}$  of 19.6 years; Study 5 in the article) indicated that AA's perceived that unhealthy behaviors were more characteristic of AA's/Blacks. These results suggest that racial-ethnic minorities may be less likely to engage in PA because PA is not

perceived to be a normative behavior for racial-ethnic minorities. This seems particularly true for AA's given the results of the study.

Additional qualitative studies suggest that PA may not be normative for AAW specifically. In research conducted by Steinbach, Green, Datta, and Edwards (2011) among 78 adult participants one AA/Black woman stated “[...] it’s not a like a cultural thing for Black minority people to be cycling. They’re not used to it, so you wouldn’t find them really doing it”, and that it was generally done by “white, middle-class men”. Moreover, she indicated that cycling was rarely covered in the Black media and lack of representation was a disincentive to engage in cycling. One study conducted among college-aged AAW further corroborate findings in Steinbach, Green, Datta, and Edwards (2011) study. In a qualitative study examining perceptions PA participation within a predominately college-aged sample of 97 AAW between the ages of 17 and 65, one participant shared that lack of portrayal of AA/Black women in media may also impact perceptions of PA for AAW. “You don’t really see like in Nike commercials or Adidas or something, you don’t ever see of bunch of black girls doing anything. You see white people all the time [...] They’ll have them in a regular commercial for clothes, but where are they in the exercise portion?” This participant later communicated that may have indirectly influenced her perceptions of AAW and engagement in PA because “[she] didn’t see that growing up” (Scott, 2018). These results suggest that AA/Black women may be less likely to engage in PA because it is not perceived as a normative behavior for AA’s, and AAW specifically.

In sum, results from these studies suggest that there are inconclusive findings regarding normative perceptions of PA for AA’s/Blacks. Some studies suggest that PA may be a normative behavior for AA’s, however other studies suggest that the opposite is true. It also seems that

normative perceptions of PA for AA's/Blacks are also conflicting within samples of AAW. Therefore, in light of mixed results, further research is needed to determine the ways in which normative perceptions of PA for AA's may influence PA engagement among AAW. While these studies suggest that normative perceptions of PA for AA's/Blacks can influence engagement in PA, several studies have been qualitative in nature, and it may be beneficial to further establish these associations using quantitative research methods.

### **Racial Identity and Normative Perceptions of PA for AA's**

Evidence examining associations between AA/Black identification and formation of normative perceptions for sports and PA is scarce, however, inferences can be made from review papers and qualitative studies. Harrison (2001) posits that the success of AA/Black athletes in sports helps to perpetuate positive self-stereotypes in sport (and PA). Results of this review suggests that there may be some consistencies with the SIT model in that there may be a link between AA/Black identification and development of normative perceptions of sport (and PA) among AA's. More specifically, this study might suggest that (1) AA's assign importance to their AA/Black identity, then (2) look to in-group members, specifically AA/Black athletes, to guide development of normative perceptions of behavior.

### **Summary of Literature Examining Racial Identity, PA Norms, and PA**

Existing literature has established links between AA/Black identity and PA and normative perceptions of PA for race and exercise behaviors. Existing literature also provides support for links between AA/Black identity and normative gendered perceptions of PA. In sum, consistent with a full SIT model, it is possible that AA's who strongly identify with their race may be more likely to engage in PA if it is perceived as a normative behavior for AA's/Blacks.

### **Multiple Identity Conceptualization and Measurement**

Researchers have developed and utilized intersectional methods to assess multiple social identities simultaneously. For example, Stirratt, Meyer, Ouellette, and Gara (2008) developed an intersectional method which examines individual characteristics associated with single identity groups and interrelationships between multiple self-classified identities. In regard to gender and racial identity among AAW specifically, one approach proposed by Jones and Day (2018) focuses on classifying AAW into one of four gendered racial identity profiles based on degree of importance one has with their gender and racial identity, personal and societal evaluation, identity engagement, and physical features. Other intersectional measurement approaches have focused on capturing qualities, values, and behaviors evidenced be characteristic of AA/Black Womanhood (Johnson, Gamst, Arellano-Morales, Meyers, Shorter-Gooden, 2016; Brown, Blackmon, Rosnick, Griffin-Fennell, White-Johnson, 2017).

There is also a parallel approach to measuring multiple social identities, specifically gender and race. Wilson & Leaper (2015) developed the multi-dimensional measurement of ethnic-racial and gender identity which includes five gender and racial identity dimensions to assess gender and racial identity using more of a parallel approach. Wilson & Leaper's (2015) measure incorporates identity dimensions from research by Cameron (2004) and Egan and Perry's (2001), and include centrality (i.e., the level of importance one has for their respective identity groups, affective evaluation (i.e., in-group affect), and connection and sense of pride (i.e., in-group ties), perceived in-group representativeness (i.e., felt-typicality), and pressure to conform to in-group norms (i.e., felt-conformity pressure). In recognizing that identities rarely operate independently of one another there is benefit in utilizing intersectional identity measurement approaches. However, given that there are multiple limitations within the gender

and racial identity literature, it seems that further exploration of gender and racial identity influences in a parallel format is the next logical step at this time.

To date, a few studies have examined gender and racial identification and their relative influence on PA simultaneously utilizing parallel measurement methods. Hamilton (2013) examined gender and racial identification, exercise identification, and social support influences in PA levels among 292 college aged AAW. Gender identity was assessed using the BSRI and racial identity was assessed using the CRIS. Results indicated that masculine gender identity, measured using traditional gendered traits, and internalized multiculturalist inclusive identity, characterized by positive attitudes about being Black and a readiness to respect and engage with members of other racial groups were positively associated and predictive of exercise identity, which is in turn predictive of increased likelihood to engage in PA (Jun & Kyle, 2012; Schumacher, Kerrigan, Remmert, Call, Zhang, & Butryn, 2019). While these results might suggest that masculine gender identity and strong racial identity were indirect predictors of PA among AAW, the BSRI and the CRIS do not assess gender and racial identity using similar dimensions.

Another study utilized a parallel measurement approach, using a similar gender and racial dimension, however there is a concern for unidimensional measurement. Howard and Borgella (2018) examined how gender or racial identity salience can influence athletic performance within a sample of 91, emerging adult-aged AA ( $M_{age}$  of 22.91) female basketball players. Gender, or race, and age (used as a control condition) was made salient using the identity importance subscale from the Collective Self-Esteem-Race scale (CSE-R; Crocker, Luhtanen, Blaine, & Broadnax, 1994) and items were modified such that each item asked about race, or gender, or age depending on the experimental condition in which participants were. Athletic performance

was measured by successful basketball free-throws. Results indicated that when gender identity was made salient, participants performed significantly worse than participants whose AA/Black race or age were made salient. Consistent with previous research, these results suggest that female gender identity may inhibit PA and sport engagement among AAW, but AA/Black racial identity may help to increase PA and sport engagement. This study examined gender and racial identity influences on sport and PA using a gender and racial centrality, an identity dimension proposed in research by Cameron (2004). These results might suggest that gender centrality may be linked to lower engagement in PA sport, but AA/Black racial centrality may be linked to increased engagement among AA/Black women. While this study examined both gender and racial centrality, a limitation is that other gender and racial identity dimensions were not assessed. In sum, given the current state of the literature examining both gender and racial identity influences in PA among AAW, more research is warranted to determine how gender and racial identification influences PA with more comprehensive measurement using a parallel identity measurement approach.

### **Preliminary Research Examining Applicability of SIT to Health Behaviors**

Notably, previous research has sought to apply a full SIT model to health behaviors model using a comprehensive and parallel approach to gender and racial identity measurement. Thornton (2018) examined associations between multiple dimensions of gender and racial identity, normative perceptions of smoking for gender and race, and smoking behavior among college-aged AAW, using the five gender and racial identity dimensions outlined by Wilson & Leaper (2015). Due to collinearity and reliability concerns, a simplified identity model, inclusive of Cameron's (2004) dimensions (i.e., centrality, in-group ties, and in-group affect) for gender and race were used to predict smoking behavior. While a three-dimensional model may have

been best fit to examine smoking behavior in Thornton (2018)'s study, it is likely that the predictive nature of identity dimensions may change depending on the health behavior in question. Therefore, in evaluating gender and racial identity influences in PA, it seems warranted to include all identity dimensions proposed in Wilson & Leaper's (2015) study in evaluating identity influences in PA.

### **Additional Factors That Contribute to Sedentary Lifestyles Among AAW**

While there are several multi-level factors that contribute to PA levels, some factors are known to be highly associated with PA levels among AAW. These factors include sociodemographic characteristics, health factors such as weight classification/BMI, self-rated health, and chronic physical illnesses, and physical appearance factors such as hair maintenance and body image satisfaction. A brief summary of the previously mentioned factors and how they may contribute to PA among AA/Black women are provided below.

**Sociodemographic factors.** Several sociodemographic factors are associated with sedentary lifestyles. In addition to high rates of physical inactivity among women when compared to men and AA/Blacks compared to other racial/ethnic groups, data from the 2017 National Health Interview Survey (NHIS) indicate that physical inactivity (as measured by those who did not meet LTPA or muscle-strengthening guidelines) are high among those who are unemployed (i.e., 47.7% for those who are unemployed, but worked previously, and 62.3% for those who have never worked), and those who are widowed and divorced/separated (i.e., 54.2% and 48.4% respectively). Results from the 2017 NHIS survey also indicates that physical inactivity increases as a function of age but decreases as a function of SES (i.e., education level and income; Blackwell & Villarroel, 2018).

In addition to age, sex, race/ethnicity, relationship status, employment and other SES factors (i.e., education level, income, and poverty status), there is also a relationship between sexual orientation and PA levels, with some studies showing that lesbian, gay, bisexual, transgendered, and questioning/queer (LGBTQ) individuals engage in less PA when compared to majority counterparts (Mereish & Poteat, 2015; VanKim, Austin, Jun, & Corliss, 2017) and others showing that they engage in more PA (Fricke, Gordon, & Downing, 2019).

In regard to AA/Black women, there are some inconsistencies in the literature when it comes to relationships between employment and relationship status and PA among AA/Black women (Eyler et al. 2002), however, studies examining correlates of PA among racial/ethnic minority women suggest that the previously mentioned sociodemographic factors important factors to consider when examining exercise behavior for AA/Black women (Eyler et al. 2002; Robinson, 2009; Siegel, Yancey, & McCarthy, 2000). Taken together, age, sex, race/ethnicity, SES variables (i.e., education level, income, and employment status) and sexual orientation are important sociodemographic factors to assess in relation to PA levels.

**Health factors.** Health factors such as being overweight or obese (as measured by BMI), self-perceived health, and chronic physical illness have been identified as barriers to PA among AA/Black women.

**Weight classification/BMI.** Weight classifications are most commonly made by obtaining an individuals' Body Mass Index (BMI), which is a measure of their weight (kg) divided by height (m<sup>2</sup>). Overweight is marked by a BMI of 25-29.99 kg/m<sup>2</sup>, and obese is marked by a BMI of 30 kg/m<sup>2</sup> or greater.; Marcus & Wildes, 2012; National Institutes of Health [NIH], 1998). While BMI does not account for body composition (i.e., muscle and bone distribution mass) and may hinder accurate measurement of body fat and body fat loss (Romero-Corral, et

al., 2008), BMI is most commonly used because it is a simple and inexpensive method to assess body fat and subsequent weight categorization.

The bi-directional relationship between overweight/obesity and sedentary lifestyles have been well-established in that low engagement in PA is a risk factor for weight gain, and weight gain may hinder PA (USDHHS, 2018). For example, Barnes (2012) highlights that data from the CDC shows that in the areas of the US where rates of obesity are higher than 30%, the prevalence of adults who are insufficiently active is also higher than 30%. Similarly, low levels of PA are predictive of weight gain over time, however, the opposite seems true of higher levels of PA for men and women (Bouchard, 2000). There is also data to suggest that BMI/Weight classifications are correlated and are predictive of PA among AAW (Buchowski et al., 2010; Robinson, 2009). Therefore, BMI and weight classification are important factors to consider in examining associations between gender and racial identity, normative perceptions of PA for gender and race, and PA levels among AAW.

***Self-perceived health.*** Self-perceptions of health have also been linked to PA engagement in that as self-perceived health increases, PA also increases. For example, among 399 AAW between the ages of 20 and 50, women who perceived that they were in good health were more likely to engage in PA (Wilbur, Chandler, Dancey, & Lee, 2003). Similarly, in a sample of older adult AAW aged 66 and older, more frequent PA was associated with higher self-rated health (Kerr et al., 2012). Taken together, these studies suggest that self-perceived health may be an important factor to assess in relation to PA levels.

***Chronic disease.*** In addition to weight status, a bi-directional relationship between chronic illness and PA levels has also been established in that chronic disease is a significant predictor of low PA levels, and low PA levels is a predictor of chronic disease development

(Edwards & Loprinzi, 2016); USDHHS, 2018; Vancampfort et al., 2017). For example, Vancampfort and colleagues (2017) found that those who were diagnosed with two or more chronic conditions were significantly less likely to engage in PA. Dhalwani and colleagues (2016) found an inverse dose-response relationship between PA levels and multimorbidity such that as multimorbidity increased, the level of PA decreased. This is likely because illness-induced functional limitations (e.g., breathlessness from COPD, and fatigue and joint pain from pain conditions) can hinder patients' ability to adopt regular PA regimens (Jerant, von Friederichs-Fitzwater, & Moore, 2005; Steeves, Shiroma, Conger, Van Domelen, & Harris, 2019). In sum, results of these studies suggest that chronic diseases may be an important factor to consider when examining associations between identity, normative perceptions of PA, and PA levels among AAW.

**Physical appearance factors.** Physical appearance factors such as hair maintenance and body image satisfaction have been identified as possible factors that may influence PA among AA/Black women.

***Hair maintenance.*** In addition to factors previously discussed, an extensive body of literature has established that hair maintenance is a significant hindrance in engage in PA for AA/Black women. For example, in a quantitative study examining ways in which hairstyle maintenance influenced exercise behaviors among 103 AAW ranging from ages 21 to 60 ( $M_{age}$  of 42.3), Hall, Francis, Whitt-Glover, Loftin-Bell, Swett, and McMichael (2013) found that 37.9% of the women avoided PA because of their hair. The most commonly cited reasons were “sweating out their hairstyle (37.9%), and time to wash, dry and style their hair (22.3%). Several other qualitative studies show that AA/Black women are reluctant to engage in PA for fear of “sweating their hair out” (Harley, 2009; Eyler et al., 2003; Hall et al., 2013; Huebschmann,

Campbell, Brown, & Dunn, 2016; Joseph, Ainsworth, Keller & Dodgso, 2015). Concern for hair maintenance may also be compounded by income and employment status as AA/Black women report they do not have the time or financial resources to devote to hair upkeep (Harley et al., 2009). Nonetheless, avoiding PA due to hair maintenance concern is an important factor to consider in examining associations between gender and racial identity, normative perceptions of PA for gender and race, and PA levels among AA/Black women.

***Body image satisfaction.*** Several studies show there is a direct relationship among body image satisfaction and PA levels. For example, in a study conducted within a predominately EA sample of men and women, Kruger, Lee, and Ainsworth (2008) found that participants who were very satisfied with their body sizes were more likely to engage in regular PA, however the opposite was true of those who were somewhat or not satisfied (i.e., 13% and 15% lower odds of engaging in PA, respectively). Millstein and colleagues (2008) also found that compared to women who were very satisfied with their body size, dissatisfied women were more likely to be physically inactive (OR = .55). Similarly, Neimark-Sztaner, Paxton, Hannan, Haines, and Story (2006) found that lower body satisfaction was predictive of lower PA levels among adolescent girls. While it seems intuitive that body image dissatisfaction may serve as a catalyst for engagement in PA, results from these studies suggest that body image dissatisfaction may be predictive of sedentary lifestyle.

Findings regarding body image satisfaction and PA among AAW may be inconclusive. In a sample of 29 college-aged AAW ( $M_{age}$  of 25), Hawkins, Tuff, and Dudley (2006) found that 90% of AAW were satisfied with their body size and the majority (i.e., 66%) engaged in some form of PA. Results from this study seem consistent with findings among EAM and EAW in that greater body image satisfaction is linked to PA. Other studies examining body

image satisfaction and PA among AAW suggest that there is no relationship between PA and body image satisfaction. For example, in a study conducted among AAW ranging from 25 to 93 years of age ( $M_{age} = 56$ ), body image satisfaction as measured by obtaining discrepancies between current and ideal body size, was not associated with PA levels (Komar-Samardzija, Braun, Keithley, & Quinn, 2011). Similarly, Kruger, Lee and Ainsworth (2008) found that associations between body image satisfaction and PA were not statistically significant for AA's.

The limited findings linking body image satisfaction and PA in AAW may be related to several factors. First, there are differences in body image satisfaction measurement across studies. Second, there may be differences in PA motivators across the developmental continuum that are obscured in studies with large age ranges. More specifically, it is speculated that younger AAW may be more concerned about their physical appearance when compared to older women. It is also speculated that older AAW may engage in PA as a means to slow progression of disease, while younger AAW may be less motivated by disease prevention. Lastly in regard to differences in links between body image and PA between AAW and EAW, there may be differences in normative body image perceptions for women and AA's, primarily in that several studies show that heavier and more curvier body types may be preferred in AA culture (Awad et al., 2015; Boyington et al., 2002; Chithmabo & Huey, 2013; Kelch-Oliver & Ancis, 2011; Rucker & Cash, 1992; Scott, 2018). In sum, findings related to body image satisfaction are more mixed among AAW in that some studies suggests that body image satisfaction helps to increase PA, while others suggest that there is no relationship between PA and body image satisfaction. Nonetheless, because of its' role in other samples, body image satisfaction may be an important factor to consider in assessing associations between identity, normative perceptions of PA, and PA among AAW

In summary, age, relationship status, SES (i.e., education level, income, and poverty status), employment status, sexual orientation, BMI, self-perceived health, chronic disease, hair maintenance, and body image satisfaction are all factors to consider as potential covariates when examining the relationships among gender and racial identity, normative perceptions of PA for gender and race, and PA levels among AAW.

### **Clinical Implications**

In reviewing culturally-tailored PA interventions within populations of AAW, Joseph, Keller, Affuso, & Ainsworth (2017) suggest that there is a need for tailoring at varying levels. First-level (i.e., surface-level) tailoring involves incorporation of social and behavioral characteristics of AAW (e.g., intervention materials that include AAW of varying body shapes and complexions and including staff members who are personable and influential in the community). Second-level (i.e., intermediate-level) tailoring includes strategies to address norms that are culturally relevant but may not be as deeply rooted in AAW culture, such as religious ties and physical appearance factors (e.g., hair maintenance). Intervention strategies at this level might include incorporating religious content into intervention materials, providing hair styling tips, or emphasizing the health benefits of PA over body size/shape concerns. Lastly, third-level (i.e., deep-level) tailoring involves modification of sociocultural gender and racial norms that hinder engagement in PA, such as collectivistic and self-sacrifice principles. Interventions at this level might include framing benefits of PA as benefits for the entire family and generational health and modifying self-sacrificial beliefs. Notably, many interventions that have aimed to improve PA among AAW have primarily utilized surface-level tailoring methods (Joseph, Keller, Affuso, & Ainsworth, 2017). This study could identify intermediate and deep-level

structure tailoring components centered on aspects of identity and perceptions of PA for gender and race.

### **Summary and Purpose**

To date, few studies have sought to use SIT as a model to understand health behavior, including PA. Several studies suggest links between specific elements of SIT (e.g., identity or norms) and PA, however, few studies have examined PA using a full SIT framework to examine racial and gender influences on PA. Application of SIT requires particular attention to identity measurement. Regarding gender identity measurement, multi-dimensional measurement of gender identity seems most appropriate based on more recent conceptualizations of gender identity, however, studies examining gender identification have primarily used unidimensional measurement. With regard to racial identity measurement, multidimensional measurement approaches are more established but lack comparability across studies focusing on racial identity. There is also a lack of comparability with studies focusing on other identity dimensions, such as gender, for which multidimensional approaches are less established. Increasing the comprehensiveness and comparability of identity measurement across the domains of gender and race will add coherence to the social identity literature and contribute to rigorous evaluation of SIT. The purpose of this study is to advance the application of SIT for examining racial and gender influences on PA in AAW, giving particular attention to parallel measurement of racial and gender identity. The aims and research questions (RQ) of the current study include:

**Aim 1:** Comprehensively measure gender and racial identification of undergraduate AAW.

**RQ1:** *To what degree do AAW identify with their gender across five gender identity dimensions?*

*RQ2: To what degree do AAW identify with their race across five racial identity dimensions?*

**Aim 2:** Assess normative perceptions of PA for gender and race.

*RQ3: To what degree do AAW perceive that PA is normative for women in general and their female friends as a more specific reference group.*

*RQ4: To what degree do AAW perceive that PA is normative for AA's in general and their AA friends as a more specific reference group.*

**Aim 3:** Examine the relationship between gender and racial identity and PA.

*RQ5: Do gender identity dimensions predict PA?*

*RQ6: Do racial identity dimensions predict PA?*

**Aim 4:** Examine the relationship between normative perceptions of PA for gender and race.

*RQ7: Do normative perceptions of PA for women and female friends predict PA?*

*RQ8: Do normative perceptions of PA for AA's and AA friends predict PA?*

**Aim 5:** Examine the relationship between gender and racial identity and normative perceptions of PA.

*RQ9: Do gender identity dimensions predict normative perceptions of PA for women and female friends?*

*RQ10: Do racial identity dimensions predict normative perceptions of PA for AA's and AA friends?*

## CHAPTER II: METHODS

### Participants

A total of 193 participants were screened and recruited from East Carolina University (ECU). The gender distribution at ECU is approximately 57% female, and 43% male and AAW make-up approximately 17% of the undergraduate student population (East Carolina University Institutional Planning Assessment, and Research, n.d.). An estimated 2000 to 2500 students interact with SONA within an academic school year, therefore, an estimated 340 to 425 students were eligible for participation.

### Procedure

Of the 193 participants, 175 were recruited from introductory level psychology courses via SONA, ECU Psychology Department's participant management system. The SONA system screens and matches students with studies for which they are eligible to participate based on demographic information provided and students who met the age requirements and self-identified as women and AA/Black were eligible to participate. An additional 18 students were recruited using a list serve generated by the Survey Review & Oversight Committee (SROC) at ECU. Students recruited outside of the online SONA system responded to gender, race, and age items in a Qualtrics survey to ensure eligibility.

Both groups of students were directed to provide electronic consent. After providing consent, participants completed a web-based survey in Qualtrics that will assessed relevant sociodemographics (i.e., age, relationship status, SES variables, such as education level, income, and employment status, and sexual orientation), and other possible covariates (i.e., BMI, self-perceived health, chronic disease, hair maintenance and body image satisfaction), gender and racial identity, perceived norms of PA for gender and race, and current levels of PA. Eligible

participants received 0.75 hours of course credit, which was commensurate with an approximate survey completion time of 45 minutes.

### **Validity Check**

Participants were presented with four validity items to ensure that they were reading carefully and responding to questions appropriately. Sample validity items included “Please respond agree to this question”, and “I have met Joan of Arc.” Validity items were regularly dispersed throughout the survey and appeared at the end of each measure. Respondents were excluded if they answered fewer than 75% of the validity items correctly. Based on previous unpublished research (Thornton, 2018), an estimated 4% of participants would be excluded due to validity concerns. Therefore, data for 5 additional participants was collected to account for the potential data that may have been lost.

### **Measures**

**Sociodemographic factors.** The American College Health Association (ACHA)-National College Health Assessment -II (NCHA-II; ACHA, 2015) is a nationally recognized survey used to collect information regarding college students’ health habits, behaviors, and perceptions. Items from this survey were used to collect demographic data regarding participants’ age, gender classification, sexual orientation, relationship/marital status, and current enrollment status. Select items from the NCHA survey was also used to collect participants’ employment status and education level. Participants were asked to provide their mother’s education level as a proxy for SES/income. Items from the NCHA -II survey were used to ensure that demographic data was collected in a way that is appropriate for college students.

**Other potential covariates.**

***Health factors.*** The NCHA-II survey was also used to obtain data regarding patient's self-reported height and weight (to calculate BMI and weight classification). One item from the NCHA was used to assess self-rated health (i.e., "How would you rate your general health?"). Responses for this item included, "excellent", "very good", "good", "fair", "poor", and "don't know". Lastly, a single item was used to determine whether participants were diagnosed with chronic physical illnesses (e.g., "Do you have any chronic illnesses such as cancer, diabetes, autoimmune disorders, or asthma?) in which participants were asked to answer yes or no.

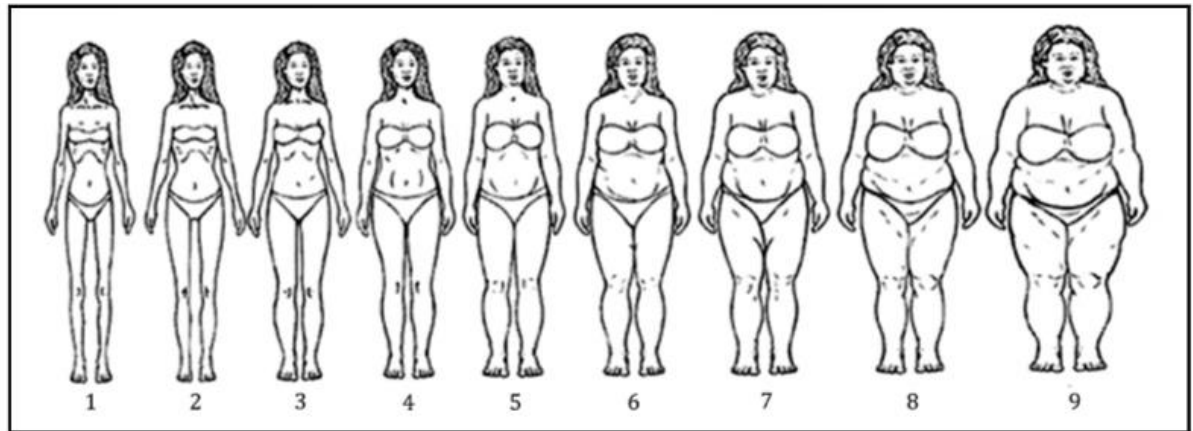
***Physical appearance factors.***

***Hair maintenance.*** Participants were asked a single item to assess whether they avoid PA due to hair maintenance concerns. Participants were asked "Do you ever avoid exercise behaviors because of your hair?" and asked to provide a yes or no answer. This question was taken from research conducted by Hall and colleagues (2013) described above.

***Body image satisfaction.*** The Body Image Scale created by Pulvers and colleagues (2004) was used to assess body image dissatisfaction by assessing discrepancies between current and ideal sizes. The Body Image Scale is a figure rating scale that consists of 9 drawings of female figures that range very thin to very obese and range in BMI's from 16 to 40 in increments of three BMI points (i.e., 1 to 9 respectively). An adapted version of the Body Image Scale (Pulvers et al., 2005) is shown in Figure 2. AAW were asked to use the Body Image Scale to complete several tasks. Participants were asked to (1) "Select the figure that closely resembles your current size and shape", and (2) "Select the figure that closely resembles the size and shape you would like to be." Discrepancy scores were obtained by subtracting the participants' ideal ratings from ratings representing their current size and shape (i.e., items 9 & 10). The Body Image scale has demonstrated sufficient internal consistency among AAW ( $\alpha > .70$ ; Pulvers et al., 2004), it has

been used to examine body image concerns in other samples of AAW (Komar-Samardzija, Braun, Keithley, & Quinn, 2012; Lynch & Kane, 2014; and it is preferred over other popular silhouette/figure rating scales, primarily in that images are considered more reflective of AAW's shapes/sizes (Pulvers et al., 2004).

*Figure 2. Body Image Scale*



*Note: Figure adapted from Pulvers et al., 2004*

**Gender and racial identity.** Wilson & Leapers' (2015) multi-dimensional model of gender and ethnic-racial identity was used to assess gender and racial identity. This measure consists of 26-items to assess five dimensions of gender and race. A description of the dimensions and exemplary items are provided below:

**Centrality.** The centrality dimension is assessed using items 1-4 of the scale. Centrality is defined as the perceived importance of one's social identity to one's self concept (e.g., "In general, being a [identity in-group] is an important part of my self-image).

**In-group affect.** In group affect refers to positive or negative attributions one has towards belonging in a select in-group (e.g., "In general, I'm glad to be a [identity-in-group]") and is assessed using items 5-8 of the scale.

***In-group ties.*** Items 9-12 make-up the in-group ties dimension. In-group ties refers to psychological connectedness and emotional closeness one feels to in-group members (e.g., “I feel strong ties to other [identity in-group]”).

***Felt-typicality.*** Felt-typicality refers to the degree to which one perceives themselves to be representative of the in group (e.g., “I feel that the things I like to do in my spare time are similar to what most people within my [identity-in group] are good at. This dimension is assessed using items 13 through 18.

***Felt-conformity pressure.*** Felt-conformity pressure is measured using the last 8 items in the measure. This dimension refers to the degree to which individuals feel pressured to adhere to social norms (e.g., “The [identity group] I know would be upset if I wanted to do things [identity out-group] usually do.”).

Participants were asked to indicate their level of agreement with each item on a 5-point Likert scale (i.e., 1 = “Disagree Strongly”, 2 = “Disagree”, 3 = “Neither Agree nor Disagree/Neutral”, 4 = “Agree”, and 5 = “Strongly Agree”). A point value was assigned to each level of agreement. Scores on items in each dimension were averaged to yield a mean rating and were interpreted on a continuum such that higher scores were reflective a stronger degree of centrality, in-group ties, in-group affect, felt-typicality, and felt-conformity pressure. All dimensions met sufficient internal consistency in the original study ( $\alpha > .70$ ; Wilson & Leaper, 2015), however, Felt-Conformity pressure for gender and race did not meet sufficient internal consistency within a sample composed entirely of AAW (Thornton, 2018).

### **Normative perceptions of PA for gender and race.**

Normative perceptions of PA for gender and racial groups were assessed using three items piloted in previous research examining normative perceptions of smoking for gender and

racial groups (Thornton, 2018), which were adapted to assess perceptions of PA. Participants were asked to rate their level of agreement on a six-point Likert scale (e.g., 1 = “Strongly Disagree, and 6 = “Strongly Agree”) on each item. The adapted statements include: “Physical activity is common among [identity in-group]”, “Physical activity is normal for [identity in-group]”, and “It is normal to see [identity-in group] individuals engaging in physical activity when they are in social situations.” Normative perceptions of PA for gender and race in general and for friends as a more specific reference group were assessed by modifying the statements above (i.e., women, female friends, African-Americans, African American friends). A point value was assigned to each level of agreement and scores on items in each dimension were averaged to yield a mean rating for perceived gender and racial PA normativity. Higher scores were reflective of greater perceived normativity. This measure has been shown to be a reliable measure of perceived smoking prevalence in McCool, Cameron and Petrie’s (2005) study ( $\alpha = .76$ ) and the adapted version was also a reliable measure to assess normative perceptions of smoking for gender and race in a college-age sample of African American women ( $\alpha = .77 - .97$ ; Thornton, 2018).

**PA.** The International Physical Activity Questionnaire Short Form (IPAQ-SF; Craig et al., 2003) is a 7-item measure was used to assess physical activity. Notably, the original measure asks participants to report the number of days and average minutes per day that they spent engaging in vigorous (e.g., heavy lifting, digging, aerobics, or fast bicycling), moderate (e.g., carrying light loads, bicycling at a regular pace, or doubles tennis), walking, and sedentary (e.g., sitting) behaviors within the last 7 days, however, in the current study, question stems were modified such that participants reported behaviors for a “typical 7-day period”. Data was scored

in two ways, including obtaining metabolic equivalent of tasks (MET) minutes per week and PA categories.

*Metabolic equivalent of task (MET) minutes per week.* MET minutes per week was calculated by multiplying the frequency and the duration for each category by respective MET values for vigorous, moderate, walking, and sedentary behaviors (i.e., Vigorous = 8, moderate = 4, walking = 2.2, Rest/Sedentary = 2).

*PA categories.* Participants were placed in one of three categories depending on their level of PA:

*High.* This category consisted of participants who engaged in vigorous intensity activities on at least 3 days achieving a minimum total 1500 MET minutes per week, or participants who engage in 7 or more days of any combination of walking, moderate intensity or vigorous intensity activities achieving a minimum total physical activity of at least 3000 MET minutes a week.

*Moderate.* This category consisted of participants who engage in 1) 3 or more days of vigorous intensity activity and/or walking at least 30 minutes per day, or 2) 5 or more days of moderate intensity activity and/or walking of at least 30 minutes per day, or 3) 5 or more days of any combination of walking, moderate intensity or vigorous intensity activities achieving a minimum total physical activity of at least 600 MET minutes a week.

*Low.* This category consisted of participants who do not meet criteria for high or moderate categories.

A copy of the measures used in the study are provided in Appendix A.

### **Power Analysis.**

This study was powered to answer the questions of whether gender and racial identity dimensions would predict PA (i.e., Research Aim 3). Using a small effect size (i.e.,  $f^2 = .15$ ), an a priori power analysis was conducted based on linear regression analysis (power = .80, Type I error rate = .05) and indicated that 139 participants are needed to detect changes in MET levels per week per one unit of change in gender and racial identity dimensions while controlling for potential covariates.

### **Data Analysis Plan.**

**Preliminary analyses.** Descriptive statistics (i.e., mean, median, mode, standard deviation, skewness, and kurtosis), were obtained for demographic and key study variables. Additionally, preliminary zero-order correlation, chi-square, fisher's exact tests, and ANOVA analyses were used to determine which variables were analyzed as covariates in primary analyses. Reliability coefficients were also computed to assess the internal consistency of each scale to ensure it is appropriate for use in further analyses. Belsey, Kun, and Welsch's (1980) procedure was used to assess for potential collinearity between predictor variables of interest. This procedure involved computation and examination of condition indices for predictor variables. Condition indices greater than 15 are indicative of problems with collinearity. Then, this procedure involved computation and examination of variance decomposition proportions of condition indices greater than 15. Variance proportions greater than 0.5 for two or more coefficients indicate the presence of problematic collinearity (Belsley, Kuh, & Welsch, 1980). In addition, CIs were examined for a significant jump in magnitude. An additional conservative step of examining the CI array created in step 1 above for a significant jump in magnitude between CIs was used to identify a cutoff beyond which predictor variables were excluded (Pedhazur, 1997).

**Primary analyses.** Primary analyses included descriptive statistics, *t*-tests, and linear and logistic regressions as detailed below:

Descriptive statistics and *t*-tests were used to answer research questions 1-4 (i.e., Aims 1 and 2). More specifically, mean gender and racial identity scores (e.g., centrality, ingroup affect, in-group ties, felt-typicality, and felt-conformity pressure) and mean scores for normative perceptions of PA for women, female friends, AA's, and AA friends were obtained and interpreted on a continuum. Then, one sample *t*-tests were used to determine whether mean scores differ significantly from neutral (i.e., scale midpoints).

Linear and logistic regression analyses were used to answer research questions 5-8 (i.e., Aims 3 and 4). More specifically, linear regression analyses were used to determine if gender and racial identity predicted MET minutes per week and linear regression analyses were also used to determine if normative perceptions of PA for gender and race predicted MET minutes per week. Logistic regression analyses were used to determine if gender and racial identity dimensions predicted PA categorization (i.e., high, moderate, and low) and linear regression analyses were used to determine whether normative perceptions of PA for gender and race predicted PA categorization.

Lastly, to answer research questions 9-10 (i.e., Aim 5), linear regression analyses were used to determine whether gender and racial identity dimensions predicted normative perceptions of PA for gender and race while controlling for potential covariates

## CHAPTER III: RESULTS

### Participant Demographics

A total of 193 participants were recruited for this study, of which 175 students were recruited through SONA, ECU Psychology Department's participant management system. An additional 18 students were recruited using a list serve generated by the SROC at ECU. Five participants were excluded as their scores on validity items were below the value for inclusion. Therefore, the final sample consisted of 188 participants. Participants' ages ranged from 18 to 24 ( $M = 18.70$ ,  $SD = 1.28$ ). Participants were primarily unpartnered (69.1%), heterosexual (68.6%), full-time students (98.9%), and first-year undergraduates (74.3%) who lived at home with their parents (50%). Many of the participants did not work for pay (54.80%), and many denied engagement in sports at the varsity, club, and/or intramural levels (i.e., 89.4%). The range of mothers' highest education level was as follows: 26.1 % post-graduate study, 31.9% college-graduate (bachelor's degree), 24.5% some college, and 17.0 % high school graduate and below. Mother's education data, collected as a proxy for SES, suggests that most of the sample consisted of participants from higher SES backgrounds. Demographic characteristics of the sample are shown in Table 1.

Table 1

#### *Demographic Characteristics of Participants (N = 188)*

Variable	<i>N</i>	%
<u>Race/Ethnicity</u>		
Black/African American	182	96.80
Biracial/Multiracial	6	3.20
<u>Sexual Orientation</u>		
Asexual	11	5.90
Bisexual	26	13.80

Lesbian	5	2.70
Pansexual	3	1.60
Queer	3	1.60
Questioning	11	5.90
Straight Heterosexual	129	68.60

Mothers' Education (SES proxy)

Elementary School	1	0.50
Some High School	4	2.10
High School Graduate	27	14.40
Some College	46	24.60
Bachelors' Degree	60	32.10
Some Graduate School	5	2.70
Graduate or Professional Degree	44	23.50

Current Year in School

1 <sup>st</sup> Year Undergraduate/Freshman	139	74.30
2 <sup>nd</sup> Year Undergraduate/Sophomore	29	15.50
3 <sup>rd</sup> Year Undergraduate/Junior	7	3.70
4 <sup>th</sup> Year Undergraduate/Senior	11	5.90
5 <sup>th</sup> Year Undergraduate Senior	1	0.50

Current Relationship Status

Single	130	69.10
In an exclusive relationship	52	27.70
In a relationship not exclusive	6	3.20

Current Residence

Campus Residence Hall	65	34.00
Other College/University Housing	1	0.50
Parent/Guardian's Home	94	50.00
Other Off-Campus Housing	28	14.40

Employment Hours

0	103	54.80
1-9	14	7.40
10-19	17	9.00
20-29	27	14.40
30-39	17	9.00
40	7	3.70

## Descriptive Statistics for Control Variables

**Participant health factors.** Regarding health factors, BMI scores (as calculated with self-reported height and weight) ranged from 16.95 to 51.24 ( $M = 26.4$ ,  $SD = 6.25$ ). The majority of participants' BMI scores fell within the normal range (39%). Most participants denied having chronic diseases (86.7%) and a significant proportion of the sample reported that they were in good health or higher (72.30%). Of those who endorsed chronic diseases, asthma was the most commonly endorsed chronic disease (10.1%). Other conditions included Lupus, Grave's Disease, POTS/Narcolepsy, Psoriasis, and Thyroid Disease. In sum, the majority of AAW in this sample were in good health. Results of the health factors are reported in Table 2.

Table 2

### *Health Characteristics of Participants (N = 188)*

Variable	N	%
<b>Weight Classification</b>		
Underweight	11	5.90
Normal Weight	73	38.80
Overweight	60	32.10
Obese	43	23.00
<b>Self-Rated Health</b>		
Poor	15	8.00
Fair	37	19.70
Good	88	46.80
Very Good	29	15.40
Excellent	19	10.10
<b>Chronic Illnesses</b>		
Yes	25	13.30
No	163	86.70

**Participant's appearance factors.** Many participants selected current body sizes/shapes that were categorized as overweight and obese (63.9%) and desired/ideal shapes/sizes within the normal BMI range (i.e., images 3 and 4; 77.7%). Body image discrepancy (BID) scores were obtained by subtracting ideal ratings from ratings representing current size and shape. BID scores ranged from .2 to 3 ( $M = .74$ ,  $SD = 1.2$ ). The majority of AAW in the sample (58%) indicated preferences for body shapes/sizes that were smaller than their current size, followed by those who were satisfied with their current size/shape (25%), then those who preferred larger shapes/sizes (17%).

### **Descriptive Statistics for Key Study Variables**

Descriptive statistics (e.g., mean, standard deviation, skewness, and kurtosis) were obtained for continuous study variables, including gender and racial identity, norms, and total MET minutes per week.

**Gender identity.** Mean scores for gender centrality, gender in-group affect, gender in-group ties, gender felt-typicality, and gender felt-conformity pressure are as follows:  $M = 3.53$  ( $SD = .63$ ),  $M = 4.31$  ( $SD = .64$ ),  $M = 3.48$  ( $SD = .79$ ),  $M = 3.18$  ( $SD = .53$ ),  $M = 2.49$  ( $SD = .50$ ), respectively. Most of the mean scores were above neutral suggesting high endorsement of gender identity.

**Racial identity.** Mean scores for racial centrality, racial in-group affect, racial in-group ties, racial felt-typicality, and racial felt-conformity pressure are as follows:  $M = 3.97$  ( $SD = .72$ ),  $M = 4.42$  ( $SD = .71$ ),  $M = 3.75$  ( $SD = .96$ ),  $M = 3.23$  ( $SD = .66$ ),  $M = 2.71$ , ( $SD = .52$ ). Many of the mean scores were above neutral, which suggests high endorsement of racial identity.

**Cross-domain comparisons.** Across both gender and racial domains in-group affect was endorsed more strongly, suggesting that participants had strong positive feelings about being

women and AAs. In contrast, gender and racial felt-typicality were among the weakest endorsed identity dimensions, suggesting that participants felt less strongly that they were representative of other women and AAs. These results are further discussed in the primary analysis section.

Means and standard deviations for gender and racial identity dimensions are reported in Table 4.

**Gender and racial PA norms.** Scores for gender PA norms  $M = 3.93$  ( $SD = .66$ ), gender friend PA norms  $M = 3.37$  ( $SD = 1.03$ ), racial PA norms  $M = 3.96$  ( $SD = .78$ ), racial friend PA norms  $M = 3.79$  ( $SD = .95$ ) were all above neutral suggesting that PA is perceived as normative for all the reference groups. These results are further discussed in the primary analysis section. The means and standard deviations for these variables are reported in Table 4.

**Physical activity.** When asked about physical activity within a typical 7-day period, participants' activities fell into multiple categories of intensity. Based on self-report, 63.6% of participants in the sample endorsed activities that fell into the vigorous activity category (e.g., heavy lifting, digging, aerobics, or fast bicycling), 74.5% of the sample endorsed activities that would fall into the moderate intensity category (e.g., carrying light loads, bicycling at a regular pace, or doubles tennis), and 94.7% of participants endorsed walking for at least 10 minutes a day. Notably, ten of the participants who reported engagement in vigorous intensity activities could not quantify the duration (i.e., "Don't know/Not Sure") or did not provide information regarding the average duration of time they spent engaged in vigorous intensity exercises. As such, a MET score for vigorous intensity activity was not calculated for these participants and a MET score for vigorous activity was not included in their total MET minutes per week calculation. Regarding moderate intensity activities, 20 participants who reported engagement in moderate intensity activities could not quantify the average duration of time spent engaging in moderate intensity activities. Therefore, a MET score for moderate intensity activity was not

calculated for these participants and their MET score for moderate intensity activity was not included in their total MET minutes per week calculation. Lastly, of participants who endorsed walking for at least 10 minutes per day, 50 could not quantify the average duration of time. However, given that these participants responded “yes” to the question, “Did you engage in walking at least 10-minutes per day?”, it was assumed that, at minimum, these participants achieved an average 33 METs per day. This MET score was used to calculate their total MET score for walking and was included in their total MET minutes per week calculation.

Total MET minutes per week was calculated by multiplying the frequency and duration of each activity by respective MET values for vigorous, moderate, and walking activities and summing the MET minutes for each activity category. Mean scores for total MET minutes per week for the total sample (N = 188) was 3857.19 (*SD* = 4773.27). Participants were also placed in intensity level categories (i.e., low, medium, high) based on their total MET score, inclusive of vigorous, moderate, and walking activities. A significant proportion of participants (i.e., 79.2%) were grouped in the moderate and high intensity categories, suggesting that this was a highly active sample of AAW. PA intensity levels of the total sample are reported in Table 3. The means and standard deviations for this variable is reported in Table 4.

### **PA Outlier Analysis & Impact on Observed PA Patterns**

Eight participants’ scores on a primary outcome variable of interest (i.e., total MET minutes per week) deviated markedly from other observations in the sample as evidenced by scores that were higher than two standard deviations from the mean. All subsequent analyses involving primary variables of interest (i.e., PA intensity level and total MET minutes per week) was conducted with these cases excluded. After excluding cases, the sample for PA analysis consisted of 180 participants and the mean total MET minutes per week score was 3087.98 (*SD*

= 2942.81). Removing outliers changed the sample’s PA profile in that fewer participants fell into the high PA intensity category, however there were no significant changes in the activity levels as there were still a significant portion of participants in the moderate and high intensity PA categories (i.e., 78.4%). PA intensity levels of the total sample prior to removing outliers and after removing outliers are reported in Table 3.

Table 3

*Participant PA Levels*

Intensity Level	All Participants		Post-Outlier Exclusion	
	<i>N</i>	%	<i>N</i>	%
Low	39	20.70	39	21.70
Moderate	66	35.10	66	36.70
High	83	44.10	75	41.70

Across all study variables, age, BMI, racial in-group affect, and total MET minutes per week, were non-normally distributed. Age was significantly non-normally distributed (Kolmogorov-Smirnov = .354,  $p < .001$ ) with a skewness of 2.34 (SE = 1.77) and kurtosis of 5.46 (SE = .35). BMI was significantly non-normally distributed (Kolmogorov-Smirnov = .095,  $p < .001$ ) with a skewness of 1.14 (SE = 0.18). Racial in-group affect was significantly non-normally distributed (Kolmogorov-Smirnov = .104,  $p < .001$ ) with a skewness of -1.72 (SE = .18), and kurtosis of 4.03 (SE = .35). Lastly, total MET minutes per week was significantly non-normally distributed (Kolmogorov-Smirnov = .209,  $p < .001$ ) with a skewness of 2.73 (SE = .18), and kurtosis of 9.296 (SE = .35). Non-parametric methods (i.e., spearman’s  $\rho$ , Welch’s adjusted  $F$  ratio, Kruskal-Wallis, and Mann Whitney U tests) were used in analyses involving non-normally distributed variables. Normality of independent variables is not assumed for regression analyses; therefore, data transformations were not warranted.

Table 4.

*Key Study Variables (N = 188)*

	<i>M</i>	<i>SD</i>
Gender Identity		
Gender Centrality	3.53	0.63
Gender In-Group Affect	4.31	0.64
Gender In-Group Ties	3.48	0.79
Gender Felt-Typicality	3.18	0.53
Gender Felt-Conformity Pressure	2.49	0.50
Racial Identity		
Racial Centrality	3.97	0.72
Racial In-Group Affect	4.42	0.71
Racial In-Group Ties	3.75	0.96
Racial Felt Typicality	3.23	0.66
Racial Felt-Conformity Pressure	2.71	0.52
PA Norms		
Gender PA Norms	3.93	0.66
Gender Friend PA Norms	3.37	1.03
Racial PA Norms	3.96	0.78
Racial Friend PA Norms	3.79	0.95
Total MET minutes/week <sup>a</sup>	3087.98	2942.81

*Note:* <sup>a</sup> n = 180

### Preliminary Analyses

**Internal consistency reliability.** Internal consistency reliability was assessed for dimensions of gender and racial identity and gender and racial PA norms.

**Gender identity.** Within the gender identity dimensions, only gender in-group affect and gender-in group ties demonstrated adequate internal consistency ( $\alpha > .70$ ). Cronbach alphas for gender centrality, gender felt-typicality, gender felt-conformity pressure ranged from .46 to .60.

**Racial identity.** Apart from racial felt-conformity pressure, all scales within the racial identity dimensions demonstrated adequate internal consistency ( $\alpha > .70$ ). The Cronbach alpha for racial felt-conformity pressure was .62.

Across both gender and racial identity domains, identity dimensions that did not demonstrate adequate internal consistency were not included in further analysis. The inter-item reliability coefficients for the gender and racial identity dimensions in the current sample are listed in Table 5.

Table 5

*Internal Consistency Reliability Coefficients for Gender and Racial Identity Dimensions in the Current Sample*

Dimensions	<u>Gender</u>	Cronbach's $\alpha$	<u>Racial</u>
Centrality	0.46		<b>0.70</b>
In-Group Affect	<b>0.81</b>		<b>0.88</b>
In-Group Ties	<b>0.75</b>		<b>0.88</b>
Felt-Typicality	0.60		<b>0.77</b>
Felt-Conformity Pressure	0.57		0.62

*Note.* Bolded items are indicative of scales that demonstrated sufficient reliability

**Gender and racial PA norms.** The adapted version of McCool, Cameron, and Petrie's (2005) items performed appropriately with all scales demonstrating sufficient reliability (gender physical activity norms  $\alpha = .77$ , gender friend PA norms,  $\alpha = .92$ , racial PA norms  $\alpha = .82$ , and racial PA norms  $\alpha = .95$ ).

### **Collinearity Analyses**

Belsey, Kun, and Welsch's (1980) procedure was used to assess for potential collinearity between predictor variables of interest. This procedure involved computation and examination of condition indices for predictor variables. Condition indices greater than 15 are indicative of

problems with collinearity. Then, this procedure involved computation and examination of variance decomposition proportions of condition indices greater than 15. Variance proportions greater than 0.5 for two or more coefficients indicate the presence of problematic collinearity (Belsley, Kuh, & Welsch, 1980). In addition, CIs were examined for a significant jump in magnitude. If the criteria for collinearity described above were not met, the additional conservative step of examining the CI array created in step 1 above for a significant jump in magnitude between CIs was used to identify a cutoff beyond which predictor variables would be further considered for exclusion (Pedhazur, 1997).

None of the gender or racial identity predictors met both criteria for collinearity (CI's above 15 and high variance proportions shared with 2 or more predictors), however, the CI for racial felt-typicality was significantly above 15 for racial identity (greater than 20) which departed markedly from the CI's of the other potential predictors. This substantial departure from the other CI's has been noted as worthy of consideration in model building (Pedhazur, 1997) and was the basis for taking the conservative approach of removing racial felt-typicality from models testing aims 3 and 5. As a result, a two dimensional model was used to determine whether gender identity predicted the degree to which physical activity was perceived as normative for their gender, and a three-dimensional model was used to determine whether racial identity predicted the degree to which physical activity was perceived as normative for their race. Models for gender identity included the dimensions of in-group affect and in-group ties and models for racial identity included the dimensions of centrality, in-group affect, and in-group ties. Results of the multi-collinearity analysis are shown in Table 6.

### **Demographic Covariate Analyses**

**Age and dependent variables.** Results from Spearman's  $\rho$ , and Pearson's correlations revealed that age was not associated with differences in gender and racial PA norms or differences in gender and racial friend PA norms. Moreover, results from Spearman's  $\rho$  correlations revealed that age was not associated with differences in total MET minutes per week. Lastly, results from a Kruskal-Wallis analysis indicated there was not an effect of age on PA intensity level. These findings indicated that there was no need to control for age in subsequent predictive analyses.

**Sexual orientation and dependent variables.** Results from Kruskal-Wallis tests and ANOVA's showed that there was no effect of sexual orientation on gender and racial PA norms, or gender and racial friend PA norms. Kruskal-Wallis tests and ANOVA's revealed that there was no effect of sexual orientation on total MET minutes per week. Results from chi-square tests of independence showed that PA intensity level did not vary by sexual orientation. These findings indicated that there was not a need to control for sexual orientation in analyses predicting these outcome variables.

**Mother's education and dependent variables.** Results from preliminary covariate analyses for mother's education and dependent variables are provided below:

***Mother's education and racial friend PA norms.*** An ANOVA showed there were significant differences between racial friend PA norms across varying levels of educational attainment for participants' mothers [ $F(3, 186) = 4.31, p < .05$ ]. More specifically, participants with mothers who had some college education perceived that physical activity was significantly less normative for their African American friends ( $M = 3.36, SD = 1.00$ ) when compared to participants with mothers who had a high school diploma and below ( $M = 3.95, SD = .75$ ), and when compared to participants with mothers who completed some post-graduate study ( $M =$

3.99,  $SD = .87$ ). Results suggest that there is a need to control for mother's education when predicting racial friend PA norms.

***Mother's education, gender and racial PA norms, gender friend PA norms, total MET minutes per week and PA intensity.*** ANOVA's and Welch's adjusted  $F$  ratio showed that there were no significant differences in gender and racial PA norms or gender friend PA norms across levels of educational attainment for participant's mothers. Moreover, a Kruskal-Wallis test revealed there were no significant differences in total MET minutes per week, and chi-square tests of independence showed that PA intensity level did not vary across levels of educational attainment for participant's mothers. This suggests that there is no need to control for mother's education in subsequent analyses predicting these variables.

**Current year in school and dependent variables.** ANOVA's showed that the degree to which physical activity was perceived as normative for gender, race, female friends, and AA friends did not differ by year in school. Results from a Kruskal-Wallis test also showed that there were no differences in total MET minutes per week across year in school, and chi-square tests of independence showed there were no differences in PA intensity across current year in school. These results indicated that there was no need to control for participants' current year in school when predicting these variables.

**Relationship status and dependent variables.** ANOVA's revealed there were no significant differences in gender and racial PA norms or gender and racial friend PA norms. A Kruskal-Wallis test revealed there were no significant differences in total MET minutes per week by relationship status. Additionally, a chi-square tests of independence showed there were no significant differences across relationship statuses endorsed and PA intensity level. Therefore, there is no need to control for relationship status in subsequent predictive analyses.

**Current residence and dependent variables.** Results from preliminary covariate analyses for current residence and dependent variables are provided below:

***Current residence and gender PA norms.*** Welch's adjusted  $F$  ratio revealed there were significant differences in gender PA norms across participant's current residence [ $F(2, 185) = 5.52, p < .05$ ]. More specifically, participants who resided on campus or in residence halls perceived that physical activity was less normative for women more broadly ( $M = 3.70, SD = .70$ ) when compared to participants who lived off campus ( $M = 4.01, SD = .43$ ) and when compared to those who resided with their parent/guardian ( $M = 4.05, SD = .64$ ). Therefore, there is a need to control for participant's current residence in subsequent analyses predicting gender PA norms.

***Current residence, racial PA norms, gender and racial friend PA norms, total MET minutes per week, and PA intensity.*** ANOVA's, Kruskal-Wallis, and Welch adjusted  $F$  ratios revealed there were no significant differences in racial PA norms, or differences in gender and racial friend PA norms. Additionally, there were no differences in total MET minutes per week across residence. A chi-square tests of independence showed there were no significant differences in PA intensity across current residence. Therefore, there is no need to control for current resident in analyses predicting these variables.

**Employment hours and dependent variables.** Results from preliminary covariate analyses for employment hours and dependent variables are provided below:

***Employment hours and PA intensity.*** Chi-square tests of independence showed that PA intensity level varied by employment hours [ $X^2(3, N = 180) = .330, p = .003$ ]. More specifically, there were more participants than expected in the High PA categories for participants who

worked 10-29 and 30 or more hours. Therefore, there is a need to control for employment hours in analyses predicting PA intensity level.

***Employment hours, gender and racial PA norms, gender and racial friend PA norms, and total MET minutes per week.*** ANOVA's showed that there were no significant differences in gender and racial PA norms or gender and racial friend PA norms across employment hours. A Kruskal-Wallis test also revealed there were no differences in total MET minutes per week, across employment hours. These results indicate that there was no need to control for employment hours when predicting these variables.

### **Health and Physical Appearance Covariate Analyses**

**BMI, weight classification, and total MET minutes per week.** Results from Spearman's  $\rho$  and ANOVA tests revealed that BMI was not associated with differences in total MET minutes per week nor were there differences in in total MET minutes per week across different weight classifications [ $H(3, 179) = 1.52, p > .05$ ]. Therefore, these variables did not covary with total MET minutes per week and there is no need to control for these variables in subsequent analyses.

**BMI, weight classification, and PA intensity.** Results from a Kruskal Wallis indicated that there were no significant differences in BMI scores across PA categories [ $H(2, 180) = 2.28, p > .05$ ]. Additionally, chi-square tests of independence showed that weight classification did not co-vary with PA intensity [ $X^2(3, N = 179) = .21, p = .24$ ]. Therefore, there is no need to control for BMI or weight classification in subsequent analyses predicting PA intensity.

**Chronic illnesses and total MET minutes per week.** Results from a Mann-Whitney U test revealed that chronic illness was not associated with differences in total MET minutes per

week ( $U = 1908.50, p = .91$ ). Therefore, there is no need to control for chronic illnesses in analyses predicting total MET minutes/week.

**Chronic illnesses and PA intensity.** Results from a chi-square tests of independence indicated that PA classification did not vary by the chronic disease presence or lack thereof [ $X^2(2, N = 180) = .02, p = .96$ ]. Therefore, there is no need to control for this variable in subsequent analyses predicting PA classification.

**BID and total MET minutes per week.** Results from Spearman's  $\rho$  revealed BID was not associated with differences in total MET minutes per week [ $\rho(180) = .11, p = .08$ ]. This indicated there is no need to control for this variable in analyses predicting total MET minutes per week.

**BID and PA intensity.** Results from an ANOVA indicated there was no significant effect of BID on PA intensity [ $H(2, 180) = 1.37, p > .05$ ]. This indicates that there is no need to control for BID in subsequent analyses predicting PA intensity.

**Self-rated health and total MET minutes per week.** Results from a Kruskal-Wallis test indicated that there was not a significant effect of self-rated health on total MET minutes per week [ $H(4, 180) = 6.20, p > .05$ ]. Therefore, there is no need to control for this variable when predicting total MET minutes/week.

**Self-rated health and PA intensity.** Results from chi-square tests of independence indicated that there were no significant differences by PA intensity across self-rated health ratings. Therefore, there is no need to control for this variable when predicting PA intensity level.

**Sport Involvement and total MET minutes per week.** Results from Mann Whitney U tests indicated were significant differences in total MET minutes per week by varsity sport

involvement, inclusive of those who endorsed participation at the varsity, club, and/or intramural levels, such that those who were involved in sports had higher total MET minutes per week on average ( $U = 958.00, p = .008$ ). These results indicate that there is a need to control for sport involvement in analyses predicting total MET minutes/week.

**Sport involvement and PA intensity.** Results from chi-square tests of independence revealed there was a significant difference in PA intensity level by sport involvement, inclusive of those who endorsed varsity, club, and/or intramural sport involvement [ $X^2 (2, N = 180) = .22, p = .01$ ]. These results indicate that there is a need to control for sport involvement in analyses predicting PA intensity level.

**Hair-related exercise avoidance and total MET minutes per week.** Results from Mann-Whitney U revealed there were no significant differences total MET minutes per week by hair-related exercise avoidance ( $U = 3796.50, p = .75$ ). These results indicate that there is no need to control for hair-related exercise avoidance in analyses predicting PA intensity level.

**Hair-related exercise avoidance and PA intensity.** Results from chi-square tests of independence revealed there were no significant differences in PA intensity level by hair-related exercise avoidance [ $X^2 (2, N = 180) = .06, p = .73$ ]. These results indicate that there is no need to control for this variable in subsequent analyses predicting PA intensity level.

**Summary of covariate analyses.** In sum, covariate analyses indicated there was a need to control for mother's education when predicting racial friend PA norms, current residence when predicting gender PA norms, employment status when predicting PA intensity level, and a need to control for sport involvement when predicting total MET minutes/week. Results from covariate analyses are shown in tables 7-19.

## **Primary Analyses**

**Aim 1:** Comprehensively measure gender and racial identification of undergraduate AAW.

**RQ<sub>1</sub>** To what degree do AAW identify with their gender across gender dimensions?

The mean scores (in order of strongest to weakest) were gender in-group affect (4.31 [ $SD = .64$ ]), and gender in-group ties [3.48 ( $SD = .79$ )]. Results from one-sample  $t$  tests showed that mean scores for both gender identity dimensions were significantly above neutral (i.e., gender in-group affect,  $t(187) = 27.94, p < .001$  and gender in-group ties,  $t(187) = 8.34, p < .001$ ). Paired sample-tests revealed that there were also significant mean differences between mean scores for gender in-group affect and mean scores for gender in-group ties ( $t(187) = 14.14, p < .001$ ). More specifically, mean scores for gender in-group affect were .83 points higher on average when compared to mean scores for gender-in group ties (95% CI [.71, .94]). Taken together, this suggests that, on average, participants agreed that they were psychologically and emotionally connected with other women, and they had strong, positive feelings about being women. These results also indicate that participants reported stronger, positive feelings about being women when compared to their sense of psychological and emotional connection to other women.

**RQ<sub>2</sub>** To what degree do AAW identify with their race across racial identity dimensions?

The mean scores (in order of strongest to weakest) were racial in-group affect (4.42 [ $SD = .71$ ]), racial centrality (3.97 [ $SD = .72$ ]), racial in-group ties (3.75 [ $SD = .96$ ]), and racial felt-typicality (3.23 [ $SD = .66$ ]). Results from one sample  $t$ -tests showed that mean scores for all identity dimensions were significantly above neutral (racial in-group affect,  $t(187) = 27.47, p < .001$ ; racial centrality,  $t(187) = 18.62, p < .00$ ; racial in-group ties,  $t(187) = 10.77, p < .001$ ; racial felt-typicality,  $t(187) = 6.10, p < .001$ ).

Results from paired samples *t*-tests revealed there were also significant differences between racial identity dimensions. Mean scores for racial in-group affect were .45, .68, and 1.13 points higher on average when compared to mean scores for racial centrality (95% CI [.32, .59]), racial in-group ties (95% CI [.56, .79]), and racial felt-typicality (95% CI [1.02, 1.24]) respectively. Additionally, mean scores for racial centrality were .22, and .67 points higher on average when compared to mean scores for racial in-group ties (95% CI [.07, .37]), and racial felt-typicality (95% CI [.55, .81]). Lastly, mean scores for racial in-group ties were .46 points higher on average (95% CI [.34, .56]) when compared to racial felt-typicality. These results suggest that on average participants agreed that they were representative of AAs, that they were psychologically and emotionally connected to other AAs, and that being AAs was important to their self-concept. These results also indicate that participants had stronger, positive feelings about being AAs when compared to their scores on other racial identity dimensions. A visual representation of results from one-sample and paired samples *t*-tests from Aim 1 are shown in Figure 3.

***Correlational analysis of gender and racial identity.*** There were significant correlations between gender and racial in-group affect ( $r = .56, p < .001$ ), and gender and racial in-group ties, ( $r = .41, p < .001$ ). As some gender and racial identity dimensions were highly correlated with one another and means were significantly above neutral, results suggest that gender and racial identity, particularly having strong positive feelings, and a sense of emotional and psychological connection for race and gender are intersectional identity dimensions among this sample AAW. Bivariate correlation analyses were not conducted for gender and racial centrality and gender and racial felt-typicality as gender and centrality and gender felt-typicality were not shown to be

reliable identity dimensions in this sample and there was not a parallel identity dimension available for comparison. These results are reported in Table 20.

In sum, results from descriptive statistics, one sample t-tests, and bivariate correlations suggest gender and race are strong, and similarly favorable self-defining markers for AAW in this sample.

**Aim 2:** Assess normative perceptions of PA for gender and race.

**RQ3:** To what degree do AAW perceive that PA is normative for women in general and their female friends as a more specific reference group.

The mean scores for gender and gender friend physical activity norms were 3.93 and 3.37 respectively. One sample *t*-tests revealed that participants' mean scores for gender physical activity norms and gender friend physical activity norms were significantly above neutral [ $t(187) = 19.41, p < .001$  and  $t(187) = 4.90, p < .001$  respectively]. Paired samples *t*-tests revealed there were significant differences between mean scores for normative perceptions of physical activity for gender and the degree to which exercise is perceived as normative for women. Mean scores for gender physical activity norms were .56 points higher on average when compared to mean scores for gender friend physical activity norms (95% CI [.40, .72]), respectively. Taken together, these results suggest that women in the sample perceive physical activity to be normative for both women in general and their female friends, however, physical activity may be perceived by participants as more normative for women as a broader reference group when compared to participants' female friends.

**RQ4:** To what degree do AAW perceive that PA is normative for AAs in general and their AA friends as a more specific reference group.

The mean scores for racial and racial friend PA norms were 3.96 and 3.79 respectively. One sample *t*-tests revealed that participants' mean scores for racial PA norms and racial friend physical activity norms were all significantly above neutral [ $t(187) = 16.79, p < .001$ ;  $t(187) = 11.32, p < .001$ ] respectively. There were significant differences between mean scores for normative perceptions of PA for race and the degree to which exercise is perceived as normative for participants AA friends. More specifically, mean scores for racial PA norms were .16 points higher on average when compared to mean scores for racial friend PA norms (95% CI [.03, .31]). Taken together, these results indicate that AAW in the sample perceive PA to be normative for both AAs in general and their AA friends, however, PA may be perceived by participants as more normative for AAs as a broader reference group than for their AA friends. A visual representation of results from Aim 2 is shown in Figure 4.

**Aim 3:** Examine the relationship between gender and racial identity and PA.

**RQ5.** Do gender identity dimensions predict PA?

*Predicting total MET minutes per week from gender identity dimensions.* A hierarchical multiple linear regression analysis was performed to determine whether gender in-group affect, and gender in-group ties predicted total MET minutes per week. Sports involvement was entered into the model first, followed by the gender identity dimensions. After controlling for the effect of sports involvement, gender identity dimensions did not significantly improve prediction of total MET minutes per week ( $R^2$  change = .004,  $F = .34, p = .71$ ). These results are shown in Table 21.

*Predicting PA intensity from gender identity dimensions.* A multinomial logistic regression was performed to model the relationship between gender identity dimensions and PA intensity (i.e., low, medium, and high PA categories). Employment status was entered into the

model as a control variable. After controlling for employment status, gender identity dimensions did not significantly contribute to the model predicting PA intensity level. These results are reported in Table 22.

**RQ6:** *Do racial identity dimensions predict PA?*

*Predicting total MET minutes per week from racial identity dimensions.* A hierarchical multiple linear regression analysis was performed to determine whether racial centrality, racial in-group affect, and racial in-group ties predicted total MET minutes per week. Sports involvement was entered into the model first, followed by the racial identity dimensions. After controlling for the effect of sports involvement, racial identity dimensions did not significantly improve prediction of total MET minutes per week ( $R^2$  change = .04,  $F = 1.11$ ,  $p = .35$ ). These results are reported in Table 23.

*Predicting PA intensity from racial identity dimensions.* A multinomial logistic regression was performed to model the relationship between racial identity dimensions and PA intensity level (i.e., low, medium, and high PA categories). Employment status was entered into the model as a control variable. After controlling for employment status, racial in-group affect was a significant contributor to models predicting PA intensity level  $\chi^2(2, N = 180) = 6.34, p = .04$ . Racial centrality and racial in-group ties were not significant contributors to the model predicting PA intensity level.

The relationship between PA intensity and racial-in-group affect can be further understood by examining parameter estimates. The reference group for paired comparisons was the high PA intensity group. Accordingly, each predictor has two parameters, one for predicting membership in the low PA intensity group as compared to membership in the high intensity group and one for predicting membership in the moderate PA intensity level as compared to the

high PA intensity level. After controlling for employment status, there was only one significant parameter for comparing the high PA group with the moderate PA group. For each one standard deviation increase in racial in-group affect the odds of being in the moderate intensity PA group changed by a factor of 1.83. These results suggest that as participants' feelings regarding their AA race increases/becomes stronger, their likelihood of belonging to the high PA intensity group decreased. Results of analyses predicting PA from racial identity dimensions are reported in Table 24 (a) and Table 24 (b).

**Aim 4:** Examine the relationship between normative perceptions of PA for gender and race PA.

**RQ7:** Do normative perceptions of PA for women and female friends predict PA?

*Predicting total MET minutes/week from gender PA norms.* A hierarchical multiple linear regression analysis was performed to determine if normative perceptions of PA for women predicted total MET minutes/week. Sports involvement was entered into the model first, followed by gender PA norms. After controlling for the effect of sports involvement, normative perceptions of PA for women did not significantly improve prediction of total MET minutes/week ( $R^2$  change = .00,  $F = .025$ ,  $p = .87$ ). These results are shown in Table 25.

*Predicting PA Intensity from gender PA norms.* A multinomial logistic regression was performed to model the relationship between gender PA norms and membership in PA intensity level (i.e., low, medium, and high PA categories). Employment status was entered into the model as a control variable. Controlling for employment status, Gender PA norms did not significantly contribute to the model predicting PA intensity. These results are reported in Table 26.

*Predicting total MET minutes per week from gender friend PA norms.* A hierarchical multiple linear regression analysis was performed to determine if normative perceptions of PA for participant's female friends predicted total MET minutes/week. Sports involvement was

entered into the model first, followed by gender friend PA norms. After controlling for the effect of sports involvement, normative perceptions of PA for participant's female friends did not significantly improve prediction of total MET minutes/week ( $R^2$  change = .00,  $F = 1.684$ ,  $p = .20$ ). These results are shown in Table 27.

*Predicting PA intensity from gender friend PA norms.* A multinomial logistic regression was performed to model the relationship between gender friend PA norms and membership in PA intensity level (i.e., low, medium, and high PA categories). Employment status was entered into the model as a control variable. After controlling for the effects of employment status, gender PA norms did not significantly contribute to the model predicting PA intensity. These results are reported in Table 28 (a) and 28 (b).

**RQ8:** Do normative perceptions of PA for AAs and AA friends predict PA?

*Predicting total MET minutes/week from racial PA norms.* A hierarchical multiple linear regression analysis was performed to determine if normative perceptions of PA for AAs predicted total MET minutes per week. Sports involvement was entered into the model first, followed by racial PA norms. After controlling for the effect of sports involvement, normative perceptions of PA for AAs did not significantly improve prediction of total MET minutes/week ( $R^2$  change = .00,  $F = .45$ ,  $p = .50$ ). These results are shown in Table 29.

*Predicting PA Intensity from racial PA norms.* A multinomial logistic regression was performed to model the relationship between racial PA norms PA intensity level (i.e., low, medium, and high PA categories). Controlling for employment status, racial PA norms did not significantly contribute to the model predicting PA intensity. These results are reported in Table 30.

*Predicting total MET minutes per week from racial friend PA norms.* A hierarchical multiple linear regression analysis was performed to determine if normative perceptions of PA for participant's AA friends predicted total MET minutes/week. Sports involvement was entered into the model first, followed by racial friend PA norms. After controlling for the effect of sports involvement, normative perceptions of PA for participants' AA friends significantly improved the prediction of total MET minutes/week ( $R^2$  change =.04 ,  $F = 7.669$ ,  $p = .006$ ). Results are shown in Table 31.

*Predicting PA intensity from racial friend PA norms.* A multinomial logistic regression was performed to model the relationship between racial friend PA norms and PA intensity level (i.e., low, medium, and high PA categories). Employment status was entered into the model as a control variable. The addition of racial friend PA norms improved the fit between the model and the data  $\chi^2 (8, N = 180) = 30.28$ , Nagelkerke  $R^2 = .176$ , 180,  $p = .000$ ). In addition to employment status, racial friend PA norms contributed to the prediction model.

The relationship between PA intensity and racial friend PA norms can be further understood by examining parameter estimates. The reference group for paired comparisons was the high intensity level PA group. Accordingly, each predictor has two parameters, one for predicting membership in the low intensity PA group as compared to membership in the high intensity group, and one for predicting membership in the moderate PA intensity group as compared to the high PA intensity group. Apart from parameters for employment status, racial friend PA norms had a significant parameter for comparing the high PA intensity group with the low PA intensity group. For each one standard deviation increase in racial friend PA norms the odds of being in the low intensity PA group changed by a factor of .60. As perceived normativity increased, the odds of being in the high intensity group increased. This result

suggests that as perceived normativity of PA for AA friends increased, the more likely participants were to be in the high intensity PA group. Results from analyses predicting PA intensity from racial friend PA norms are reported in Table 32 (a) and Table 32 (b).

**Aim 5:** Examine the relationship between gender and racial identity and normative perceptions of PA.

*RQ9: Do gender identity dimensions predict normative perceptions of PA for women and female friends?*

*Predicting normative perceptions of PA for gender identity dimensions.* A hierarchical multiple linear regression analysis was performed to determine whether gender in-group affect and gender in-group ties predicted normative perceptions of PA for women. Current residence was entered into the model first, followed by the gender identity dimensions. After controlling for the effect of current residence, gender identity dimensions did not significantly improve prediction of normative perceptions of PA for women ( $R^2$  change = .007,  $F = .731$ ,  $p = .4$ ). These results are shown in Table 33.

*Predicting normative perceptions of PA for participants' female friends from gender identity dimensions.* A linear regression analysis was performed to determine whether gender in-group affect and gender in-group ties predicted normative perceptions of PA for women. Results indicated that gender in-group affect significantly contributed to the prediction model ( $F(2, 185) = 5.125$ ,  $p = .007$  and explained 4.2% of the variance. Gender in-group affect contributed to the prediction model ( $B = .17$ ,  $p = .027$ ) and gender in-group ties did not ( $B = .10$ ,  $p = .21$ ). These results suggest that stronger positive feelings toward their gender was predictive of viewing PA as more normative for participants' female friends. These results are shown in Table 34.

***RQ10:** Do racial identity dimensions predict normative perceptions of PA for AAs and AA friends?*

*Predicting normative perceptions of PA for AAs from racial identity dimensions.* A linear regression analysis was performed to determine whether racial centrality, racial in-group affect, and racial in-group ties predicted normative perceptions of PA for women. Results from regression analyses revealed that racial identity dimensions did not significant predict normative perceptions of PA for AAs ( $R^2$  change = .033,  $F = 2.065$ ,  $p = .106$ ). These results are shown in Table 35.

*Predicting normative perceptions of PA for AA friends from racial identity dimensions.* A hierarchical multiple linear regression analysis was performed to determine whether racial centrality, racial in-group affect, and racial in-group ties predicted normative perceptions of PA AA friends. Mother's education was entered into the model first, followed by the racial identity dimensions. Racial identity dimensions did not significantly improve prediction of normative perceptions of PA for AA friends ( $R^2$  change = .026,  $F = 1.731$ ,  $p = .16$ ). These results are shown in Table 36.

In sum, results suggest that when gender and racial factors are considered, racial factors seem to have more of an influence as it relates to identity and norms on PA within this sample. A detailed visual of Aims 3-5 for gender and race are provided in figures in figures 7-10 and a visual representation depicting significant findings for gender and race are provided in figures 5 and 6 below:

Figure 5: Gender Influences in PA

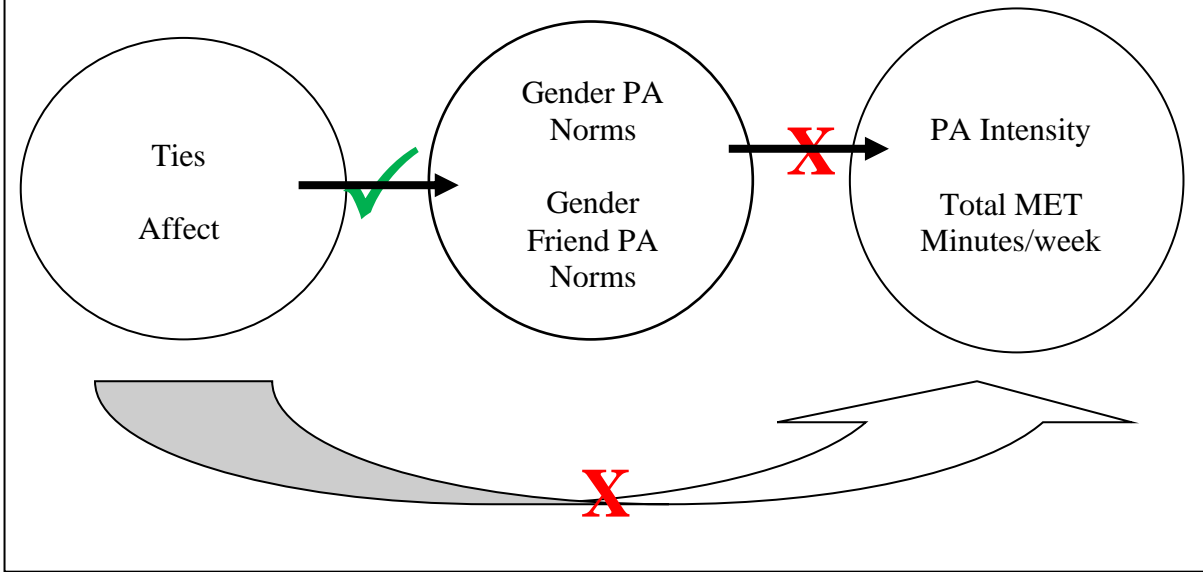
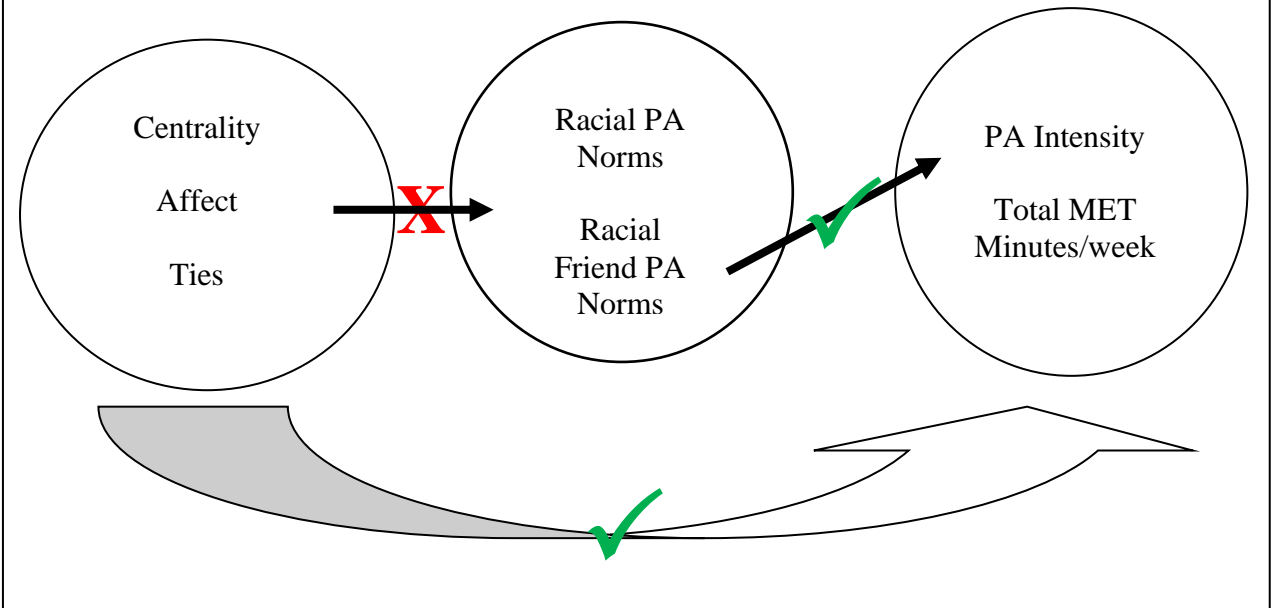


Figure 6: Racial Influences in PA



## CHAPTER IV: DISCUSSION

The primary purpose of this study was to examine gender and racial influences on PA of college-aged AAW using a SIT framework. This study sought to (1) comprehensively measure gender and racial identification, (2) examine perceived PA norms for gender and race, (3) determine whether gender and racial identity predicted PA, (4) determine whether gender and race-related PA norms predict PA, and (5) examine links between gender identity and gender-related PA norms, and links between racial identity and race-related PA norms.

### Review of Key Findings

**Gender and racial identity.** Of the dimensions that were examined in parallel, there were similar patterns of endorsement of gender and racial identity. On average participants felt strong positive feelings about being women and AAs (i.e., in-group affect) and they felt that they were psychologically and emotionally connected with other women and AAs (in-group ties). Moreover, gender and racial identity were positively correlated with one another. Taken together, these results suggest that gender and race are strong, and intertwined markers for AAW in this sample.

Regarding gender and racial identity subscale performance, only two subscales, including in-group affect and in-group ties were reliable within the gender domain. In the racial domain, four subscales, including centrality, in-group affect, in-group ties, and felt-typicality were reliable. Across both gender and racial domains, the dimension of felt-conformity pressure did not reach sufficient internal consistency reliability. These findings are consistent with unpublished research indicating that gender and racial felt-conformity pressure do not demonstrate sufficient reliability within a sample composed predominately of college-aged AAW (Thornton, 2018), but inconsistent with research that shows gender centrality and gender-

felt typicality were reliable (Thornton, 2018). The research implications of variable reliability for subscales will be discussed further below.

**Gender and race-related physical activity norms.** Overall, participants perceived that PA was normal for women and AAs in their immediate social circles and for women and AAs in general. PA was perceived as more normative for women and AAs in general than participants' friends. Findings for gender are inconsistent with previous research that suggests PA is not characteristic of women and girls (Davison, Schmalz, & Downs, 2010; Shaw & Henderson, 2005; Henderson, Stalnaker, & Taylor, 1988). Findings for race are consistent with research that shows PA is perceived as characteristic of AAs (Bimper & Harrison, 2011; Harrison, L., Harrison, C. K., & Moore, 2002; Stone, Lynch, Sjomeling, & Darley, 1999; Swierad, Vartanian, & King, 2017).

**PA patterns.** Many participants in this sample exceeded PA guidelines as most were categorized in the high (41.70%) and moderate (36.70%) intensity level groups. This is inconsistent with national data which shows that approximately 59% of AAW are not engaging in sufficient levels of PA (Blackwell & Villarroel, 2018). This is also inconsistent with national data that shows approximately 35.6% of college-aged AAW met aerobic activity recommendations (Wilson & Bopp, 2021) and inconsistent with research that shows rates of physical inactivity become more pronounced for racial/ethnic minority women during college years (Suminski, Petosa, Utter, & Zhang, 2002; Wallace, Buckworth, Kirby, & Sherman, 2000). Possible explanations for findings that are inconsistent with past studies are discussed in the sociocultural context considerations sections below.

**Predicting PA from gender and racial identity.** Positive feelings about being AA/Black (i.e., in-group affect) was predictive of exercise. This result is consistent with research

that shows racial identity, inclusive of items that assess racial pride and/or positive racial regard, are positively associated with exercise (Lewis, Boutrin, Dalrymple & McNeill, 2018) Siegel, Yancey, & McCarthy, 2000; Johnson, 2002; Smalley, Warren, McClendon, Peacock & Caro, 2016). These results are further discussed in the research implications section.

**Predicting PA from gender and racial physical activity norms.** If participants felt exercise was normal for their AA/Black friends (i.e., racial friend PA norms), they were more likely to engage in exercise. Normative perceptions of exercise for gender (i.e., gender PA norms and gender friend PA norms) were not a significant contributor to PA. These results are consistent with research that suggests higher perceived normativity of PA for AAs may be predictive of engagement in PA (Harvey & Afful, 2011; Swierad, Vartanian, & King, 2017). These results are further discussed in the section below addressing applicability of SIT.

**Predicting PA norms from gender and racial identity.** Positive feelings about being women (i.e., in-group affect) was predictive of perceiving PA as normal for female friends (i.e., gender friend PA norms). In contrast, racial identity was not a predictor of racial PA norms. This is one of the critical links in examining the applicability of SIT and one of the first studies to establish a link between identity and norms. These results are further discussed in the research implications section.

## **Research Implications**

**Applicability of findings to SIT model for conceptualizing gender and racial influences in PA.** Consistent with SIT, it was speculated that those who identify with their gender and race may perceive PA as identity congruent. In turn, individuals will exercise to enhance their sense of belonging with their gender and race. As shown in figures 5 and 6 above, results from this study provide differential support for SIT links across gender and race. For

gender, results indicated a link between gender identity and perceived PA norms. However, results did not establish links between perceived PA norms and PA, nor links between gender identity and PA. For race, links were established between identity and PA and between norms and PA, but not identity and norms. Taken together, the full SIT model was not supported for gender or race for this sample of college-aged AAW. However, as this was one of the first studies to examine PA behavior in AAW using a SIT framework and one of few studies to utilize a SIT framework to examine gender and racial influences in health promoting behaviors among AAW, additional research is needed to determine if it is an appropriate model for predicting PA from gender and racial identity.

**Multidimensional measurement of gender and ethnic-racial identity.** Wilson & Leaper's (2015) Multidimensional Measure of Gender and Ethnic-Racial Identity performed moderately well within this sample of college-aged AAW, particularly in the racial domain. As described, felt-conformity pressure across gender and race did not meet sufficient internal consistency. In review of items that made up the felt-conformity pressure subscale, items assess pressure from parents and pressure from peers. There is research to suggest that peer influence on behaviors may be a stronger driver of behaviors among college-aged individuals (Cialdini, Reno, & Kalgren, 1990) as opposed to pressure from parents. Therefore, it is likely that items that assessed for pressure from parents were not as relevant for college-aged AAW when compared to items that assessed pressure from peers, thus contributing to low internal consistency for gender and racial felt-conformity pressure in this sample.

In the gender domain, gender centrality and gender felt-typicality were also subscales that did not meet sufficient internal consistency reliability. There have been consistent findings in previous research that show these subscales are internally consistent in college-aged samples

(Thornton, 2018; Wilson & Leaper, 2015), and a sample predominately composed of AAW (Thornton, 2018). It seems likely that when multiple gender identity dimensions are considered, being a woman and perceived similarity to other women were not relevant for how college-aged AAW in this sample defined themselves in terms of their gender. Instead, connection and belonging with other women and having strong positive feelings about being a woman were most relevant.

While multidimensional measurement was achieved to a degree within this study, there were issues with multi-collinearity and redundancy when identity dimensions were evaluated for model building to predict norms for PA and PA. These concerns were addressed using procedures established by Belsley, Kuh and Welsch (1980) which resulted in a two-dimensional model for gender identity, inclusive of centrality, and felt-typicality, and a three-dimensional model for racial identity, inclusive of centrality, in-group ties, and in-group affect. It is not well understood which identity dimensions are most relevant to PA as current research has not provided unequivocal support for specific gender and racial identity dimensions in predicting health behaviors. It seems likely that the most relevant identity dimensions can vary by health behavior and by identity reference group. For gender, there is overlap in dimensions included in a model predicting smoking behavior (Thornton, 2018), those dimensions being in-group affect and in-group ties. For race, there is also overlap in dimensions included in a model predicting smoking behavior (Thornton, 2018) those dimensions inclusive of centrality, in-group affect, and in-group ties. For these reasons, it could be argued that smaller 2-to-3-dimensional identity models may be most effective in predicting health behaviors, however, additional psychometric research is warranted to allow for improvement in building multi-dimensional models to predict PA and health behaviors more broadly.

**Sociocultural context considerations.** The current sociopolitical climate during data collection may have influenced scale performance in this sample. More specifically, race may have been a more salient identity in comparison to gender identity. This seems plausible as 2020 was marked by increased efforts to achieve social justice and increased publicization of racial injustices in the media. Increased racial salience may have contributed to differential patterns of responding to items that assess gender and racial identity across various dimensions which, in turn, could have contributed to higher reliability on scales that assess racial identity dimensions compared to those that assessed gender identity dimensions. There is an increasing need for cross sectional and longitudinal studies to examine gender and racial identity profiles for college-aged AAW as they live in times of sociopolitical unrest and heightened focus on racial injustice.

The COVID-19 pandemic is also an important socio-contextual factor to consider in understanding PA patterns and racial identity for participants in this sample. More specifically, the pandemic may have been tied to increased engagement in exercise for college-aged AAW. Social isolation, fatigue, and/or boredom due to virtual work, virtual learning, and increased domestic responsibilities such as caretaking for younger and/or older relatives were common concerns that came with strict social distancing guidelines and nationwide lockdowns. Exercise may have been an attractive option to gain reprieve and to break the monotony of the day. In sum, this may have been a more active sample because exercise was among the limited leisure activities that were encouraged during the lockdown. Additional research examining PA profiles of college-aged AAW may be warranted to determine if these findings will hold true as states continue to relax pandemic restrictions.

In addition to possibly promoting more PA in this sample, the COVID-19 pandemic also highlighted racial inequalities in health care access and outcomes, further increasing the salience

of race in American society and, perhaps, the perceived need for increased engagement in health behaviors to reduce vulnerability to more severe COVID-19 outcomes. More specifically, it is well documented that underserved AAs have been disproportionately impacted by COVID-19 (Holmes et al., 2020). It seems plausible that the COVID-19 pandemic highlighted ways in which AAW were at risk for poorer health outcomes if infected and may have been more motivated to reduce risk for chronic disease management and subsequent health issues by adopting PA regimens.

**Notable covariate findings and considerations for future research.** While not a primary focus of this study, there were significant findings within the covariate analyses that warrant further discussion. First, there were differences with regard to normative perceptions of PA for participant's AA friends across levels of mother's educational attainment, such that PA was perceived to be less normative for AAW whose mother's completed some college compared to those who had a high school diploma and compared to those who completed post-graduate study. There were also differences with regard to normative perceptions of PA for women and participant's current residence. More specifically, participants who resided on campus or in campus residence halls perceived that PA was less normative for women when compared to those that lived off campus and compared to those who resided with their parent and/or guardian. These findings seem counterintuitive and suggest that there is a need for further exploration of associations between SES and PA norms and residence and PA norms among college-aged AAW.

Lastly, there were differences in PA intensity by level of employment. Surprisingly, there were more participants than expected in the high PA intensity category that worked 10-29 and 30 or more hours. There are several possible explanations for the finding in the current study. First,

participants' worksites may have had comprehensive workplace wellness programs for employees, inclusive of employee organized walking and running groups, exercise and fitness classes, on site-facilities, commercial fitness memberships at local exercise facilities at free and/or discounted rates, and/or prizes, money and bonuses for engaging in health promotion activities. Another possible explanation for differences in PA intensity by level of employment may be related to types of occupations that college-aged AAW had during the study period. Information regarding workplace and occupational roles was not obtained; however, participants may have had highly active or physically demanding jobs. Highly active jobs might include personal trainers and restaurant hosts or servers, such that physical exertion was incorporated into their daily regimen (i.e., occupational PA) and AAW in this sample may have interpreted this as physical activity. Previous research has demonstrated that AA/Blacks feel that occupational activity is a form of physical exercise, such that they perceive LTPA is not warranted (Airhihenbuwa, Kumanyika, Agurs, & Lowe, 1995). In sum, future research examining PA among AAs/Blacks should consider employment-based factors and strategies to differentiate labor-based physical activity and leisure time physical activity.

### **Clinical Implications**

Given the results of the current study, it seems that PA engagement may be related to racial identification. Studies show behavioral interventions are most effective in promoting a desired behavior when they align with important values and priorities (Adams, Bezner, & Steinhardt, 1995; Butryn, Forman, Hoffman, Shaw, & Juarascio, 2011). Therefore, it seems plausible that strong positive feelings regarding being AA may be an important value system that clinicians can activate to aid in sustaining high levels of PA among college-aged AAW. Moreover, strong

feelings regarding being AAs may also be a value system to active to motivate sedentary individuals to action.

In addition to racial identification, PA engagement may also be related to perceived exercise norms for AA friends. In general, many research studies have shown perceptions of peer norms to be salient for influencing health behaviors (Cialdini, Reno, and Kallgren, 1990; Priebe & Spink, 2011; Priebe & Spink, 2012). It is also well-documented that social support is helpful in motivating AAW to exercise (Belza, Walwick, Shiu-Thornton, Schwartz, Taylor, & LoGerfo, 2004), specifically among college-aged AAW (D'Alonzo, & Fischetti, 2008). Findings from the current study suggest that AA/Black friends are an important reference group and may have a significant influence in college-aged AAW's PA patterns. More specifically, incorporating components that encourage exercise support, specifically from AA friends who exercise, may also aid in sustaining exercise levels and motivating sedentary AAW to action. In sum, there is more to learn about racial factors and how they may influence motivations of frequent exercisers. Racial factors related to positive feelings regarding being AAs and perceptions of PA for AA friends may be important factors to incorporate into PA health promotion programs for college-aged AAW to ensure continued engage in this behavior.

### **Study Limitations**

**Sample characteristics.** Sample characteristics is a limitation in the current study. This sample predominately consisted of freshman college students. Moreover, a significant proportion of participants resided at home with their parents/guardians, which may seemingly be due to COVID-19 guidelines. Additionally, approximately 30% of the sample identified as sexual minorities. Based on these characteristics, this sample may not be a good representation of all college-aged AAW. Additionally, results may not be generalizable to all college-aged AAW or

post-pandemic samples. Future studies should consider data collection methods with the goal of collecting data from participants across the range of undergraduate classification levels (e.g., sophomore, Juniors, seniors) and variability in current residence. Future studies should also consider nuanced ways that sexual identity may impact normative perceptions of PA for gender and race and PA behaviors.

**Measurement of physical factors.** Measurement of physical factors (i.e., weight and height) may have been a limitation in the current study. Physical factors, such as weight and height, were solely based on self-report. This could have led to over or underreporting of these variables. This is likely as research shows that there are inaccuracies in reporting these variables among female college students (Larsen, Ouwens, Engels, Eisinga, & van Strien, 2008; Sherry, Jefferds & Grummer-Strawn, 2007). As such, findings in the current study may not be comparable to past and future studies with more rigorous, objective measurements of PA.

**PA measurement.** PA measurement may have also been a significant limitation in this study. First, PA measurement was also based on self-report, which could have contributed to socially desirable responding, as well as self-report and recall bias (Lam, Macfarlane, Lam & Stewart, 2011). Future studies might consider objective forms of PA measurement (e.g., acti-watches). Second, PA was measured in a way that did not allow for participants to describe activities (e.g., biking, weightlifting, yoga, or something else). Obtaining this information may be important in that there may be exercises that are perceived as more or less normative and would provide more detail for research and possible components for intervention. Future studies might consider open ended response items for participants to provide that level of detail of PA. Lastly, it is also possible that the PA measure used in this study produced an overestimation of the sample's exercise behavior, as research conducted by Lee, Macfarlane, Lam, and Stewart

(2011) found that the IPAQ-SF overestimated physical activity levels by 36 to 173 percent. Notably, it could be argued that PA behavior in this sample was underestimated as there were 30 participants who reported PA but did not provide detail regarding exercise duration. Despite the likelihood of underestimation this was still an active sample and PA levels would have been higher had all participants provided detailed information.

### **Future Directions**

Given compounded risks of chronic disease development, poorer disease-related quality of life, and risk of mortality for AAW, further exploration of factors that promote engagement in protective behaviors such as PA is warranted. Gaining understanding of the ways in which gender and racial identity can influence PA might help to improve current PA interventions for AAW. More specifically, continuing to explore gender and racial factors in PA may aid in improving existing PA interventions and health promotion programs for AAW by identifying components to sustain PA levels or to increase engagement in PA. Future studies exploring how SIT may be an applicable framework for understanding PA engagement and health-promoting behaviors are needed and it may be beneficial to continue this line of research to determine if there is a quantifiable link between identity and norms to establish health behaviors, such as PA, as identity-congruent. Cross-sectional and longitudinal studies to gain understanding of the ways that identity and norms may influence PA behavior within the emerging adulthood age ranges, particularly among AAW. These may be crucial steps for future action to improve PA intervention and to ultimately reduce negative health outcomes associated with physical inactivity among AAW.

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## APPENDIX A: IRB APPROVAL



**EAST CAROLINA UNIVERSITY**  
**University & Medical Center Institutional Review Board**  
4N-64 Brody Medical Sciences Building· Mail Stop 682  
600 Moye Boulevard · Greenville, NC 27834  
Office 252-744-2914 · Fax 252-744-  
2284 · [rede.ecu.edu/umcirb/](http://rede.ecu.edu/umcirb/)

## Notification of Exempt Certification

?

From: Social/Behavioral IRB  
To: [Shelly Thornton](#)  
CC: [Lisa Campbell](#)  
Date: 12/3/2019  
Re: [UMCIRB 19-001875](#)  
Physical Activity and College-Aged African American Women

I am pleased to inform you that your research submission has been certified as exempt on 12/3/2019. This study is eligible for Exempt Certification under category # 2A.

It is your responsibility to ensure that this research is conducted in the manner reported in your application and/or protocol, as well as being consistent with the ethical principles of the Belmont Report and your profession.

This research study does not require any additional interaction with the UMCIRB unless there are proposed changes to this study. Any change, prior to implementing that change, must be submitted to the UMCIRB for review and approval. The UMCIRB will determine if the change impacts the eligibility of the research for exempt status. If more substantive review is required, you will be notified within five business days.

Document	Description
Physical Activity and African American Women Informed Consent(0.01)	Consent Forms
S. Thornton Dissertation Measures(0.01)	Surveys and Questionnaires
S. Thornton Dissertation Proposal (0.01)	Study Protocol or Grant Application

For research studies where a waiver of HIPAA Authorization has been approved, each of the waiver criteria in 45 CFR 164.512(i)(2)(ii) has been met. Additionally, the elements of PHI to be collected as described in items 1 and 2 of the Application for Waiver of Authorization have been determined to be the minimal necessary for the specified research.

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418  
IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418

## APPENDIX B: CONSENT DOCUMENTS

## Physical Activity and African American Women

You are invited to participate in an online research study conducted by Shelly A. Thornton, MA, a doctoral student in Clinical Health Psychology at East Carolina University. You are being invited to participate because you (1) identify as an African American woman, and (2) are between the ages of 18 and 25.

### **Purpose**

The purpose of this study is to examine associations between gender and racial identity, normative perceptions of physical activity, and physical activity among African American Women.

### **Potential Benefits**

Your participation will help increase understanding of associations between gender and racial identity and physical activity among African American women.

### **Procedure**

You will be asked to complete an online survey. This survey will ask questions about your current exercise patterns, how you feel about physical activity in relation to your gender and race, and your experiences as a woman and African American. This survey should take approximately 30-45 minutes to complete.

### **Confidentiality**

Your responses will be stored in a password protected electronic format. You **WILL NOT** be asked to provide your name or other identifying information during this survey; therefore, no one will be able to link your name with your responses. If you would like to participate in the gift card drawing, you will be directed to a separate survey where you will be asked to provide your contact information. This information will be stored separately from your survey responses. Once data collection is complete, de-identified responses will be downloaded and kept in password protected file on the researchers' password protected computer.

### **Potential Risks**

There are no foreseeable risks involved in participating in this study other than those encountered in day-to-day life.

### **Participation and Withdrawal**

Your participation in this survey is completely voluntary. You may refuse to take part in the research or exit the survey at any time without consequence.

### **Contact Information**

If you have questions, comments, or concerns about this study please do not hesitate to contact Shelly A. Thornton, MA at [thorntonsh14@students.ecu.edu](mailto:thorntonsh14@students.ecu.edu).

**Rights of Research Participants:** You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights, or remedies because of your participation in this study. If you have any questions regarding your rights as a research participant, please contact the Office of Research Integrity & Compliance at (252) 744-2914.

You may print a copy of this form for your records.

Please read the following statements and if you agree, select "I agree" below:

- (1) I have read (or had read to me) all of the above information
- (2) I have had an opportunity to ask questions about things in this research I did not understand and have received satisfactory answers.
- (3) I know that I can stop taking part in this study at any time
- (4) By signing this informed consent form, I am not giving up any of my rights.
- (5) I have been given a copy of this consent document and it is mine to keep.

- Agree
- Disagree

## Physical Activity and African American Women

You are invited to participate in an online research study conducted by Shelly A. Thornton, MA a doctoral student in Clinical Health Psychology at East Carolina University. You are being invited to participate because you (1) identify as an African American woman, and (2) are between the ages of 18 and 25.

### **Purpose**

The purpose of this study is to examine associations between gender and racial identity, normative perceptions of physical activity, and physical activity among African American Women.

### **Potential Benefits**

Your participation will help increase understanding of associations between gender and racial identity and physical activity among African American women.

### **Procedure**

You will be asked to complete an online survey. This survey will ask questions about your current exercise patterns, how you feel about physical activity in relation to your gender and race, and your experiences as a woman and African American. This survey should take approximately 1 hour to complete.

### **Confidentiality**

Your responses will be stored in a password protected electronic format. You **WILL NOT** be asked to provide your name or other identifying information during this survey; therefore, no one will be able to link your name with your responses. Once data collection is complete, de-identified responses will be downloaded and kept in password protected file on the researchers' password protected computer.

### **Potential Risks**

There are no foreseeable risks involved in participating in this study other than those encountered in day-to-day life.

### **Participation and Withdrawal**

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### **Contact Information**

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- (3) I know that I can stop taking part in this study at any time
- (4) By signing this informed consent form, I am not giving up any of my rights.
- (5) I have been given a copy of this consent document and it is mine to keep.

- Agree
- Disagree

## APPENDIX C: MEASURES

## DEMOGRAPHICS & HEALTH

*First, we would like to learn a little bit more about you. Please answer these questions to the best of your ability.*

How old are you? \_\_\_\_ Years

What sex were you assigned at birth, such as on an original birth certificate?

Male

Female

Do you identify as transgender?

Yes

No

Which term do you use to describe your gender identity?

Woman

Trans man

Man

Genderqueer

Trans woman

Another Identity (please specify: \_\_\_\_\_)

Which term best describes your sexual orientation?

Asexual

Bisexual

Gay

Lesbian

Pansexual

Queer

Questioning

Same Gender Loving

Straight/Heterosexual

Another Identity (please specify: \_\_\_\_\_)

What is your height in ft and inches? \_\_\_\_ Ft \_\_\_\_ In

What is your weight in pounds? \_\_\_\_\_ lbs

What is your year in school?

1<sup>st</sup> Year Undergraduate

2<sup>nd</sup> Year Undergraduate

3<sup>rd</sup> Year Undergraduate

4<sup>th</sup> Year Undergraduate

5<sup>th</sup> Year or more Undergraduate

Graduate or professional

Not seeking a degree

Other

What is your enrollment status?

- Full-Time
- Part-Time
- Other (please specify \_\_\_\_\_).

How do you usually describe yourself?

- White (Caucasian/ European or European American)
- Asian or Asian American
- Latino/a or Latin American
- Black or African American
- Native American/ Alaskan Native/ Native Hawaiian
- Caribbean Islander
- Pacific Islander
- Biracial or Multiracial
- Other

What is your relationship status?

- Single
- In an exclusive relationship
- Married/cohabitating
- Divorced/widowed
- In a relationship that is not exclusive
- Other

What is *your mother's highest level of education*?

- Elementary School
- Some High School
- High School graduate
- Some college
- College Degree (Bachelors)
- Some Graduate School
- Graduate or Professional Degree (Master's, Doctorate, Medical, Law)

Where do you currently live?

- Campus residence hall
- Fraternity or Sorority house
- Other college/university housing
- Parent/Guardian's Home
- Other off-campus housing
- Other

How many hours a week do you work for pay?

- 0 hours
- 1-9 hours
- 10-19 hours
- 20-29 hours
- 30-39 hours
- 40 hours
- More than 40 hours

How many hours a week do you volunteer?

- 0 hours
- 1-9 hours
- 30-39 hours
- 40 hours

\_\_\_ 10-19 hours  
\_\_\_ 20-29 hours

\_\_\_ More than 40 hours

What is your approximate cumulative grade average?

\_\_\_ A. \_\_\_ B. \_\_\_ C. \_\_\_ D/F. \_\_\_

Within the last 12 months, have you participated in organized college athletics at any of the following levels? Please mark yes or no for each.

Varsity

\_\_\_ Y \_\_\_ N

Club Sports

\_\_\_ Y \_\_\_ N

Intramurals

\_\_\_ Y \_\_\_ N

Do you have any chronic illness such as cancer, diabetes, autoimmune disorders, or asthma?

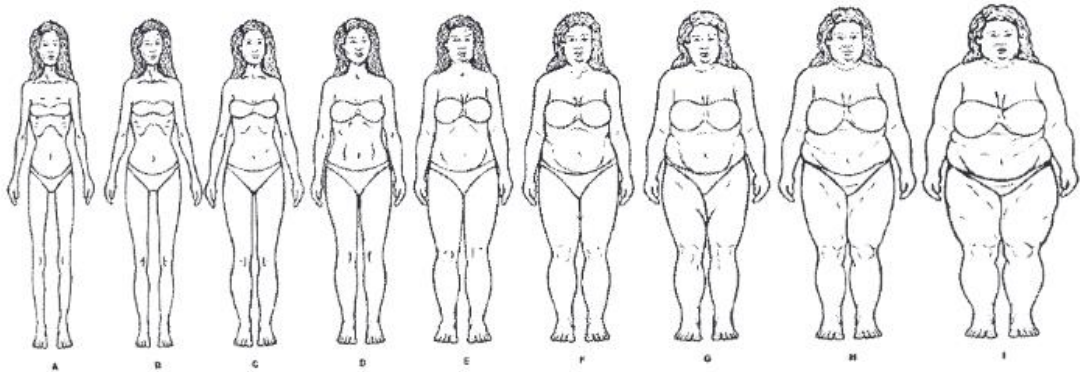
\_\_\_ Y \_\_\_ N

Do you ever avoid exercise because of your hair?

Y \_\_\_ N

### BODY IMAGE SATISFACTION

*Please use the image below to answer the following questions:*



*Figure adapted from Pulvers et al., 2004*

Select the figure that closely resembles your current size and shape. \_\_\_

Select the figure that resembles that size and shape you would like to be \_\_\_\_\_

### PHYSICAL ACTIVITY

*We are interested in finding out the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you typically spend being physically active in a **typical 7-day period**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.*

*Think about all the **vigorous** activities that you do in a **typical 7-day period**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.*

During a typical **7-day period**, on how many days do you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- No vigorous activities

How much time did you usually spend doing **vigorous** physical activities on one of those days? Please provide the number of hours and minutes per day (e.g., 1 hour and 45 minutes). If you are unsure please write "Don't know/Not Sure" .

---

*Think about all the moderate activities that you do in a typical 7-day period. Moderate physical activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.*

During a typical 7-day period, on how many days do you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis. Do not include walking.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- No moderate physical activities

How much time did you usually spend doing **moderate** physical activities on one of those days? Please provide the number of hours and minutes per day (e.g., 1 hour and 45 minutes). If you are unsure please write "Don't know/Not Sure"

---

*Think about the time you spend **walking** in a typical 7-day period. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.*

During a typical 7-day period, on how many days did you **walk** for at least 10 minutes at a time.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- No walking

How much time did you usually spend **walking** on one of those days? Please provide the number of hours and minutes per day (e.g., 1 hour and 45 minutes). If you are unsure please write "Don't know/Not Sure"

---

*The last question is about the time you spend **sitting** on weekdays during a **typical 7-day period**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.*

During a **typical 7 day period**, how much time did you spend **sitting** on a **weekday**? Please provide the number of hours and minutes per day (e.g., 1 hour and 45 minutes). If you are unsure please write "Don't know/Not Sure"

---

### **GENDER AND RACIAL IDENTITY**

*Now, we would like to know more about your experiences as women. Please read each statement carefully and provide your honest and true reaction to each statement.*

I often think about the fact that I am a woman.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

Overall, being a woman has very little to do with how I feel about myself.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

In general, being a woman is an important part of my self-image.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

The fact that I am a woman rarely enters my mind.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

In general, I'm glad to be a woman.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I often regret that I am a woman.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I don't feel good about being a woman.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

Generally, I feel good when I think about myself as a woman.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I don't feel I fit in with other women.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I feel strong ties to other women.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I find it difficult to form a bond with other women.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I don't feel a sense of being "connected" with other women.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I feel like I'm just like all the other women.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I have a lot in common with other women.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I think that I am a good example of what it means to be a woman.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I feel that the things I like to do in my spare time are similar to what most women are good at.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I feel that the kinds of things I'm good at are similar to what most women are good at.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I don't feel that my personality is similar to most women's personalities.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

The women I know would be upset if I wanted to do things men usually do.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I think my parents would be upset if I wanted to learn an activity that men usually do.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I don't think my parents would be upset if I told them I was interested in things that men usually like.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I get really mad if someone says I'm acting like a man.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I don't think other women would be upset if I wanted to learn an activity that men usually do.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I think other women would be upset if I told them I was interested in things that men usually like.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I don't think my parents would mind if I showed interests in hobbies that are mostly for men.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I think the women I know would mind if I showed interests in hobbies that are mostly for men.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

Please respond "Neither Agree nor Disagree" to this question (**VALIDITY**)

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

*Now we would like to know more about your experiences as an African American. Please read each statement carefully and provide your honest and true reaction to each statement.*

I often think about the fact that I am a member of my racial group.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

Overall, being a member of my racial group has little to do with how I feel about myself.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

In general, being a member of my racial group is an important part of my self-image.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

The fact that I am a member of my racial group rarely enters my mind.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

In general, I'm glad to be a member of my racial group.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I often regret that I am a member of my ethnic group.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I don't feel good about being a member of my ethnic group.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

Generally, I feel good when I think about myself as a member of my ethnic group.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I don't feel I fit in with other people within my ethnic group.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I feel strong ties to other people within my ethnic group.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I find it difficult to form a bond with other people within my ethnic group.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I don't feel a sense of being "connected" with other people within my ethnic group.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I feel like I'm just like all other people within my ethnic group.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I have a lot in common with other people within my ethnic group.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I think that I am a good example of what it means to be a member of my ethnic group.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I feel that the things I like to do in my spare time are similar to what most people within my ethnic group are good at.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I feel that the kinds of things I'm good at are similar to what most people within my ethnic group are good at.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I don't feel that my personality is similar to most people within my ethnic groups' personalities.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

The people within my ethnic group I know would be upset if I wanted to do things that people outside my ethnic group usually do.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I think my parents would be upset if I wanted to learn an activity that other ethnicities usually do.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I don't think my parents would be upset if I told them I was interested in things that other ethnicities usually like.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I get really mad if someone says I'm acting like people outside my ethnic group.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I don't think other people within my ethnic group would be upset if I wanted to learn an activity that other ethnicities usually do.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I think other people within my ethnic group would be upset if I told them I was interested in things that other ethnicities usually like.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I don't think my parents would mind if I showed interests in hobbies that are mostly for other ethnicities.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I think the other people within my ethnic group I know would mind if I showed interests in hobbies that are mostly for other ethnicities.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor disagree (3)
- Agree (4)
- Strongly Agree (5)

Please respond "Strongly Agree" to this statement (**VALIDITY**)

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

## **NORMATIVE PERCEPTIONS OF PA FOR GENDER AND RACE**

### **PA NORMS-WOMEN**

*Please read each statement and select the option that best fits your reaction to each statement.*

Physical activity is common among women.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

Physical activity is normal for women.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

It is normal to see women engaging in physical activity social situations.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor disagree (3)
- Agree (4)
- Strongly Agree (5)

**PA NORMS- FEMALE FRIENDS**

*Please read each statement and select the option that best fits your reaction to each statement.*

Physical activity is common among my female friends.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

Physical activity is normal for my female friends.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

It is normal to see my female friends engaging in physical activity in social situations.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I met Joan of Arc last year. (**VALIDITY**)

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

### **PA NORMS-AA**

*Please read each statement carefully and select the option that best fits your reaction to each statement.*

Physical activity common among African-Americans

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

Physical activity is normal among African-Americans

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

It is normal to see African-Americans engaging in physical activity in social situations

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

### **PA NORMS-AA-FRIENDS**

*Please read each statement carefully and select the option that best fits your reaction to each statement.*

Physical activity common among my African-American friends

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

Physical activity is normal for my African-American friends

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

It is normal to see my African-American friends engaging in physical activity in social situations

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

Please respond "Strongly Disagree" to this statement. (**VALIDITY**)

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

## APPENDIX D: FIGURES & TABLES

Table 6

*Summary of Multicollinearity Analysis*

Variable	Condition Index	Variance Proportions				
		Constant	Centrality	Affect	In-Group Ties	Felt-Typicality
Gender Identity						
Constant	1.00	0.00	N/A	0.00	0.00	N/A
Gender In-Group Affect	10.27 <sup>a</sup>	0.15	N/A	0.08	0.98	N/A
Gender In-Group Ties	<b>16.55<sup>a</sup></b>	0.85	N/A	0.91	0.01	N/A
Racial Identity						
Constant	1.00	0.00	0.00	0.00	0.00	0.00
Racial Centrality	10.82 <sup>a</sup>	0.05	0.24	0.00	0.30	0.35
Racial In-Group Affect	15.22 <sup>a</sup>	0.10	0.49	0.10	0.35	0.14
Racial In-Group Ties	<b>16.44<sup>a</sup></b>	0.01	0.06	0.35	0.07	0.69
Racial Felt-Typicality	<b>23.38</b>	0.85	0.21	0.55	0.28	0.12

*Note.* Bolded items indicative of possible problematic collinearity.

<sup>a</sup> Indicates that the variable was entered into the regression model

Table 7

*Correlations Between Age, Gender and Racial Identity Variables, Gender and Racial PA Norms, and Total MET minutes per week (N = 188)*

	1	2	3	4	5	6	7	8	9	10	11
1. Age <sup>a</sup>											
2. BMI <sup>a</sup>	.08										
3. BID	.06	<b>.68***</b>									
4. Gender PA Norm	.00	-.01	.09								
5. Gender Friend PAN	-.00	-.08	.06	<b>.21**</b>							
6. Racial PA Norm	.07	<b>-.16*</b>	-.12†	<b>.35***</b>	<b>.16*</b>						
7. Racial Friend PA Norm	.05	<b>-.16*</b>	.02	<b>.17**</b>	<b>.58***</b>	<b>.41***</b>					
12. Total MET minutes/week <sup>ac</sup>	.02	-.05	-.12†	.02	.09	.03	<b>.18*</b>	.03	.07	.04	<b>.17*</b>

*Note.* <sup>a</sup> spearman's  $\rho$  was used to examine associations for these variables as they were non-normally distributed

<sup>c</sup> N = 180

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ . †  $p = .05-.09$ .

Table 8

*ANOVA/Welch/Kruskal-Wallis Tests for Sexual Orientation and Dependent Variables (N = 187)*

Identity Dimension	Analysis	<i>F/H</i>	<i>df</i>	<i>p</i>
Gender PA Norm	ANOVA	.35	3	.79
Gender Friend PA Norm	ANOVA	.98	3	.41
Racial PA Norm	ANOVA	.04	3	.99
Racial Friend PA Norm	ANOVA	.85	3	.47
Total MET minutes/week <sup>a</sup>	Kruskal-Wallis	2.27	3	.52

*Note.* <sup>a</sup> *n* = 180

Table 9

*ANOVA/Welch/Kruskal-Wallis Tests for Mother's Education Level and Dependent Variables (N = 186)*

Identity Dimension	Analysis	<i>F/H</i>	<i>df</i>	<i>p</i>
Gender PA Norm	ANOVA	1.87	3	.14
Gender Friend PA Norm	ANOVA	2.29	3	.08 <sup>†</sup>
Racial PA Norm	ANOVA	1.07	3	.36
Racial Friend PA Norm	ANOVA	4.31	3	<b>.01</b> *
Total MET minutes/week <sup>a</sup>	Kruskal-Wallis	1.44	3	.70

*Note.* <sup>a</sup> *N* = 179

\* *p* < .05., <sup>†</sup> *p* = .05-.09.

Table 10

*ANOVA/Welch/Kruskal-Wallis Tests for Current Year in School and Dependent Variables (N = 186)*

Identity Dimension	Analysis	<i>F/H</i>	<i>df</i>	<i>p</i>
Gender PA Norm	ANOVA	.91	3	.44
Gender Friend PA Norm	ANOVA	1.39	3	.25
Racial PA Norm	ANOVA	1.03	3	.38
Racial Friend PA Norm	ANOVA	.54	3	.66
Total MET minutes/week <sup>a</sup>	Kruskal-Wallis	2.90	3	.41

*Note.* <sup>a</sup>N = 179

\* *p* < .05

Table 11

*ANOVA/Welch/Kruskal-Wallis Tests for Relationship Status and Dependent Variables (N = 187)*

Identity Dimension	Analysis	<i>F/H</i>	<i>df</i>	<i>p</i>
Gender PA Norm	ANOVA	1.02	2	.36
Gender Friend PA Norm	ANOVA	.44	2	.64
Racial PA Norm	ANOVA	1.58	2	.21
Racial Friend PA Norm	ANOVA	.31	2	.74
Total MET minutes/week <sup>a</sup>	Kruskal-Wallis	5.75	2	.06 <sup>†</sup>

*Note.* <sup>a</sup>N = 180

<sup>†</sup>*p* = .05-.09.

Table 12

*ANOVA/Welch/Kruskal-Wallis Tests for Current Residence and Dependent Variables (N = 185)*

Identity Dimension	Analysis	<i>F/H</i>	<i>df</i>	<i>p</i>
Gender PA Norm	Welch	5.52	2	<b>.01*</b>
Gender Friend PA Norm	Welch	.116	2	.89
Racial PA Norm	ANOVA	.23	2	.80
Racial Friend PA Norm	ANOVA	.64	2	.53
Total MET minutes/week <sup>a</sup>	Kruskal-Wallis	2.87	2	.24

*Note.* <sup>a</sup>N = 178

\* *p* < .05

Table 13

*ANOVA/Welch/Kruskal-Wallis Tests for Employment Hours and Dependent Variables (N = 187)*

Identity Dimension	Analysis	<i>F/H</i>	<i>df</i>	<i>p</i>
Gender PA Norm	ANOVA	.56	3	.64
Gender Friend PA Norm	ANOVA	1.52	3	.24
Racial PA Norm	ANOVA	.66	3	.36
Racial Friend PA Norm	ANOVA	1.12	3	.30
Total MET minutes/week <sup>a</sup>	Kruskal-Wallis	6.85	3	.07 <sup>†</sup>

*Note.* <sup>a</sup>N = 180

<sup>†</sup> *p* = .05-.09.

Table 14

*Differences in Age, BMI, and BID across PA Intensity Level*

Variable	Analysis	<i>F/H</i>	<i>df</i>	<i>p</i>
Age	Kruskal-Wallis	.98	2	.61
BMI	Kruskal-Wallis	2.28	2	.32
BID	ANOVA	1.37	2	.25

Table 15

*Differences in MET minutes/week by Chronic Disease, Results from Mann-Whitney U*

	N	Rank Average	Rank Total	<i>U</i>	<i>p</i>
Yes	25	91.66	2291.50	1908.50	.91
No	155	90.31	13998.50		

Table 16

*Differences in MET minutes/week by Exercise Hair Avoidance, Results from Mann-Whitney U*

	N	Rank Average	Rank Total	<i>U</i>	<i>p</i>
Yes	73	89.01	6497.50	3796.50	.75
No	107	91.52	9792.50		

Table 17

*Differences in total MET minutes/week by Sport Involvement, Results from Mann-Whitney U*

	N	Rank Average	Rank Total	U	<i>p</i>
Yes	19	120.58	2291.50	958.00	<b>.008**</b>
No	161	86.95	13999.00		

*Note: \*\*  $p < 01$ .*

Table 18

*Sexual Orientation, Mother's Education Level, Year in School, Relationship Status, Employment Hours, and Current Residence, by PA Intensity Level*

Variable	PA Intensity				<i>p</i>
	Low % (n)	Moderate % (n)	High % (n)	Total % (n)	
Sexual Orientation					.50
Bisexual	35.00 (7)	25.00 (5)	40.00 (8)	100.00 (20)	
Lesbian	0.00 (0)	25.00 (1)	75.00 (3)	100.00 (4)	
Straight Heterosexual	20.30 (26)	39.80 (51)	39.80 (51)	100.00 (128)	
Other Queer Sexual Orientations	21.40 (6)	32.10 (9)	46.40 (13)	100.00 (28)	
Total	21.70 (39)	36.70 (66)	41.70 (75)	100.00(180)	
Mother's Education (SES)					.70
High School Grad and Below	31.30 (10)	28.10 (9)	40.60 (13)	100.00 (32)	
Some College	18.20 (8)	40.90 (18)	40.90 (18)	100.00(44)	
College-Graduate	23.20 (13)	35.70 (20)	41.10 (23)	100.00 (56)	
Post-Graduate Study	14.90 (7)	40.40 (19)	44.70 (21)	100.00 (47)	
Total	21.20 (38)	36.90 (66)	41.90 (75)	100.00(180)	
Current Year in School					.73
1 <sup>st</sup> Year Undergraduate/Freshman	20.90 (28)	37.30 (50)	43.90 (56)	100.00 (134)	
2 <sup>nd</sup> Year Undergraduate/Sophomore	30.80 (8)	30.80 (8)	44.80 (10)	100.00 (26)	
3 <sup>rd</sup> Year Undergraduate/Junior	0.00 (0)	42.90 (3)	57.10 (4)	100.00 (7)	
4/5 <sup>th</sup> Year Undergraduate/Senior	16.70 (2)	41.70 (5)	41.70% (5)	100.00 (12)	
Total	21.20% (38)	36.90 (66)	41.90 (75)	100.00 (179)	
Relationship Status					.20
Single	26.20 (33)	36.50 (46)	37.30 (47)	100.00 126)	
In an exclusive relationship	10.40 (5)	37.50 (18)	52.10 (25)	100.00 (48)	
In a relationship not exclusive	16.70 (1)	33.30 (2)	50.00 (3)	100.00 (6)	

Total	21.70 (39)	36.70 (66)	41.70 (75)	100.00 (180)	
Current Residence					.60
Campus Residence/University Housing	17.20 (11)	37.50 (24)	45.30 (29)	100.00 (64)	
Parent/Guardian's Home	27.00 (24)	34.80 (31)	38.20 (34)	100.00 (89)	
Other Off-Campus Housing	16.00 (4)	40.00 (10)	44.00 (11)	100.00 (25)	
Total	21.90 (39)	36.50 (65)		100.00 (178)	
Employment Hours					.00**
0 hours	22.30 (23)	41.70 (43)	35.90 (37)	100.00 (103)	
1-9 hours	21.40 (3)	65.20 (8)	21.40 (3)	100.00 (14)	
10-29 hours	10.930 (4)	35.90 (14)	53.80 (21)	100.00 (39)	
30+	37.50 (9)	4.20 (1)	58.3 (14)	100.00 (29)	
Total	21.70 (39)	36.70 (66)	41.70 (75)	100.00 (180)	

---

\*  $p < .05$

Table 19

*Weight Classification, Self-Rated Health, Sport Involvement, Chronic Illness, and Hair Exercise Avoidance by PA Intensity Level*

Variable	PA Intensity Level			<i>p</i>
	Low % (n)	Moderate % (n)	High % (n)	
Weight Classification				.24
Underweight	45.50 (5)	9.10 (1)	45.5 (5)	100.00 (11)
Normal Weight	18.30 (13)	33.80 (24)	47.90 (34)	100.00 (71)
Overweight	19.60 (11)	41.10 (23)	39.30 (22)	100.00 (56)
Obese	22.00 (9)	43.90 (18)	34.10 (14)	100.00 (41)
Total	21.20 (38)	36.90 (66)	41.90 (75)	100.0 (179)
Self-Rated Health				.40
Poor	33.30 (5)	20.00 (3)	46.70 (7)	100.00 (15)
Fair	21.80 (8)	42.90 (15)	34.30 (12)	100.00 (35)
Good	17.90 (15)	40.50 (34)	41.70 (35)	100.00 (84)
Very Good	14.80 (4)	33.30 (9)	51.90 (14)	100.00 (27)
Excellent	36.80 (7)	26.30 (5)	36.80 (19)	100.00 (19)
Total	21.70 (39)	36.70 (66)	41.70 (75)	100.00 (180)
Sport Involvement				.01*
Yes	10.50 (2)	15.80 (3)	73.70 (14)	100.00 (19)
No	23.0.50 (37)	39.10 (63)	37.90 (61)	100.00 (161)
Total	21.70 (39)	36.70 (66)	41.70 (75)	100.00 (180)
Chronic Illness				.96
Yes	20.00 (5)	36.00 (9)	44.00 (11)	100.00 (25)
No	21.90 (34)	36.80 (57)	41.30 (64)	100.00 (155)
Total	21.70 (39)	36.70 (66)	41.70 (75)	100.00 (180)
Hair and Avoiding Exercise				.73
Yes	21.90 (16)	39.70 (29)	38.40 (28)	100.00 (73)

No	21.50 (23)	34.60 (37)	43.90 (47)	100.00 (107)
Total	21.70 (39)	36.70 (66)	41.70 (75)	100.00 (180)

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\*  $p < .05$ .

Table 20

*Intercorrelations Between Gender and Racial Identity Subscales*

	1	2	3	4	5
1. Gender In-Group Affect					
2. Gender In-Group Ties	<b>.39***</b>				
3. Racial Centrality	.04	-.02			
4. Racial In-Group Affect <sup>a</sup>	<b>.56***</b>	<b>.40***</b>	<b>.26***</b>		
5. Racial In-Group Ties	<b>.40***</b>	<b>.41***</b>	<b>.26***</b>	<b>.58***</b>	
6. Racial Felt-Typicality	<b>.32**</b>	<b>.27***</b>	<b>.18*</b>	<b>.42***</b>	<b>.62***</b>

*Note.* <sup>a</sup> spearman's  $\rho$  was used to examine associations for these variables as they were non-normally distributed

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

Table 21

*Hierarchical Regression Analyses for Gender Identity Dimensions Predicting Total MET minutes/week*

Variable	Step 1			Step 2		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
Control <sup>a</sup>	1730.53	704.01	<b>.18*</b>	1789.79	710.22	<b>.19*</b>
In-Group Affect				94.74	234.58	.03
In-Group Ties				-193.72	235.47	-.06
<i>R</i> <sup>2</sup>		<b>.03*</b>			.04	
<i>F</i> for change in <i>R</i> <sup>2</sup>		6.04			.34	
<i>n</i>		178			175	

*Note.* a Control variable was sports involvement

\**p* < .05.

Table 22

*Contributions in Multinomial Logistic Regression Analysis Predicting PA Intensity from Gender Identity Dimensions (n = 180)*

Variable	$X^2$	<i>df</i>	<i>p</i>
Control <sup>a</sup>	23.77	6	<b>.001</b> ***
Gender In-Group Affect	.48	2	.79
Gender In-Group Ties	.32	2	.85

*Note.* <sup>a</sup> Control variable was employment status

*p* < .01. \*\*\*

Table 23

*Hierarchical Regression Analyses for Racial Identity Dimensions Predicting Total MET minutes/week*

Variable	Step 1			Step 2		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
Control <sup>a</sup>	1730.53	704.01	<b>.18*</b>	1645.55	709.23	<b>.17*</b>
Centrality				-123.07	227.88	-.04
In-Group Affect				-415.93	262.87	-.14
In-Group Ties				415.32	269.15	.14
<i>R</i> <sup>2</sup>		<b>.02*</b>			.05	
<i>F</i> for change in <i>R</i> <sup>2</sup>		6.04			1.105	
<i>N</i>		178			175	

*Note.* a Control variable for total MET minutes/week was sports involvement

\**p* < .05

Table 24 (a)

*Contributions in Multinomial Logistic Regression Analysis Predicting PA Intensity from Racial Identity Dimensions (n = 180)*

Variable	$X^2$	<i>df</i>	<i>p</i>
Control <sup>a</sup>	22.83	6	<b>.001</b> ***
Racial Centrality	.31	2	.86
Racial In-Group Affect	6.34	2	<b>.04</b> *
Racial In-Group Ties	4.27	2	.12

*Note.* <sup>a</sup> Control variable was employment status

\**p* < .05. \*\*\* *p* < .001.

Table 24 (b)

*Parameter Estimates for the Reduced Model for Prediction of PA Intensity from Racial Identity Dimensions (n = 180)*

Variable	High PA vs.	B	OR	p
Employment Status				
No Work	Low	-.08	.92	.88
	Moderate	2.72	15.18	<b>.01*</b>
< 10 hours/week	Low	.46	1.59	.62
	Moderate	3.72	41.32	<b>.003**</b>
10-29 hours/week	Low	-1.20	.30	.08 <sup>†</sup>
	Moderate	2.24	9.39	<b>.04*</b>
30+ hours/week	Low	N/A	N/A	N/A
	Moderate	N/A	N/A	N/A
Racial In-Group Affect	Low	.19	1.21	.43
	Moderate	.60	1.83	<b>.019****</b>

*Note. Control variable was employment status*

\* $p < .05$ . \*\*  $p < .01$ , \*\*\* $p < .001$ , <sup>†</sup>  $p = .05-.09$ , \*\*\*\* $p < .025$  (calculated to correct for family-wise error rate).

Table 25

*Hierarchical Regression Analyses for Gender PA Norms Predicting Total MET minutes/week*

Variable	Step 1			Step 2		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
Control <sup>a</sup>	1730.53	704.01	<b>.18*</b>	1739.99	708.46	<b>.18*</b>
Gender PA Norm				34.60	218.29	.01
<i>R</i> <sup>2</sup>		<b>.03*</b>			.03	
<i>F</i> for change in <i>R</i> <sup>2</sup>		6.04			.03	
<i>n</i>		178			177	

Note. <sup>a</sup>Control variable for total MET minutes/week was sports involvement

\**p* < .05

Table 26

*Contributions in Multinomial Logistic Regression Analysis Predicting PA Intensity from Gender PA Norms (n = 180)*

Variable	<i>X</i> <sup>2</sup>	<i>df</i>	<i>p</i>
Control <sup>a</sup>	24.05	6	<b>.001***</b>
Gender PA Norm	2.07	2	.36

Note. Control variable was employment status

\*\*\**p* < .001

Table 27

*Hierarchical Regression Analyses for Gender Friend PA norms Predicting Total MET minutes/week*

Variable	Step 1			Step 2		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	<i>B</i>
Control <sup>a</sup>	1730.53	704.01	<b>.18*</b>	1623.55	707.48	<b>.17*</b>
Gender Friend PA Norm				282.85	217.99	.10
<i>R</i> <sup>2</sup>	<b>.03*</b>			.04		
<i>F</i> for change in <i>R</i> <sup>2</sup>	6.04			1.68		
<i>N</i>	178			177		

Note. <sup>a</sup> Control variable was sports involvement

\**p* < .05

Table 28(a)

*Contributions in Multinomial Logistic Regression Analysis Predicting PA Intensity from Gender Friend PA Norms (n = 180)*

Variable	<i>X</i> <sup>2</sup>	<i>df</i>	<i>p</i>
Control <sup>a</sup>	26.51	6	<b>.000***</b>
Gender Friend PA Norm	8.57	2	<b>.01*</b>

Note. <sup>a</sup> Control variable was employment status

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

Table 28 (b)

*Parameter Estimates for the Reduced Model for Prediction of PA Intensity from Racial Identity Dimensions (n = 180)*

Variable	High PA vs.	B	OR	p
Employment Status				
No Work	Low	-.19	.83	.72
	Moderate	2.89	17.92	<b>.007**</b>
< 10 hours/week	Low	.24	1.27	.80
	Moderate	3.78	43.22	<b>.002**</b>
10-29 hours/week	Low	-1.46	.23	<b>.04*</b>
	Moderate	2.36	10.54	<b>.03*</b>
30+ hours/week	Low	N/A	N/A	N/A
	Moderate	N/A	N/A	N/A
Gender Friend PA Norm	Low	-.40	.67	.055 <sup>†</sup>
	Moderate	.24	1.27	.19

*Note. Control variable was employment status*

\* $p < .05$ , \*\* $p < .01$ , , <sup>†</sup>  $p = .05$ -.09.

Table 29

*Hierarchical Regression Analyses for Racial Friend PA Norms Predicting Total MET minutes/week*

Variable	Step 1		Step 2			
	<i>B</i>	<i>SE B</i>	<i>B</i>	<i>B</i>	<i>SE B</i>	$\beta$
Control <sup>a</sup>	1730.53	704.01	<b>.18*</b>	1710.89	705.71	<b>.18*</b>
Racial Friend PA Norms				145.81	217.45	.05
<i>R</i> <sup>2</sup>		<b>.03*</b>			.00	
<i>F</i> for change in <i>R</i> <sup>2</sup>		6.04			.45	
<i>N</i>		178			177	

Note. <sup>a</sup>Control variable was sports involvement

\**p* < .05

Table 30

*Contributions in Multinomial Logistic Regression Analysis Predicting PA Intensity from Racial PA Norms (n = 180)*

Variable	$X^2$	<i>df</i>	<i>p</i>
Control <sup>a</sup>	23.97	6	<b>.001**</b>
Racial PA Norms	.52	2	.77

Note. <sup>a</sup> Control variable was employment status

\*\*  $p < .01$

Table 31

*Hierarchical Regression Analyses for Racial Friend PA Norm Predicting Total MET minutes/week*

Variable	Step 1		Step 2		$\beta$	
	<i>B</i>	<i>SE B</i>	<i>B</i>	<i>SE B</i>		
Control <sup>a</sup>	1730.53	704.01	<b>.18*</b>	1564.90	693.76	<b>.16*</b>
Racial Friend PA Norm				591.97	213.77	<b>.20**</b>
$R^2$		<b>.03*</b>			<b>.06**</b>	
<i>F</i> for change in $R^2$		6.04			7.67	
<i>N</i>		178			177	

Note. <sup>a</sup> Control variable was sports involvement

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

Table 32 (a)

*Contributions in Multinomial Logistic Regression Analysis Predicting PA Intensity from Racial Friend PA Norms (n = 180)*

Variable	$X^2$	<i>df</i>	<i>p</i>
Control <sup>a</sup>	23.09	6	<b>.001**</b>
Racial Friend PA Norms	6.53	2	<b>.038*</b>

*Note. Control variable was employment status*

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

Table 32 (b)

*Parameter Estimates for the Reduced Model for Prediction of PA Intensity from Racial Friend PA Norms (n = 180)*

Variable	High PA vs.	B	OR	p
Employment Status				
No Work	Low	-.24	.79	.65
	Moderate	2.71	15.02	.01
< 10 hours/week	Low	.27	1.31	.79
	Moderate	3.55	34.81	<b>.004**</b>
10-29 hours/week	Low	-1.34	.26	.059 <sup>†</sup>
	Moderate	2.18	8.84	<b>.046*</b>
30+ hours/week	Low	N/A	N/A	N/A
	Moderate	N/A	N/A	N/A
Racial Friend PA Norms	Low	-.51	.60	<b>.013*</b>
	Moderate	-.18	.84	.34

*Note. Control variable was employment status*

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , <sup>†</sup> $p = .05-.09$ .

Table 33

*Hierarchical Regression Analyses for Gender Identity Dimensions Predicting Gender PA Norms*

Variable	Step 1		Step 2			
	<i>B</i>	<i>SE B</i>	<i>B</i>	<i>B</i>	<i>SE B</i>	<i>B</i>
Control <sup>a</sup>	-.52	.15	<b>-.25**</b>	-.52	.15	<b>-.25**</b>
Gender In-Group Affect				.06	.07	.06
Gender In-Group Ties				.04	.08	.04
<i>R</i> <sup>2</sup>		<b>.06*</b>			.07	
<i>F</i> for change in <i>R</i> <sup>2</sup>		12.30			.73	
<i>N</i>		184			182	

*Note.* a Control variable was current residence

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

Table 34

*Hierarchical Regression Analyses for Gender Identity Dimensions Predicting Gender Friend PA Norms*

Variable	Step 1		
	<i>B</i>	<i>SE B</i>	$\beta$
Gender In-Group Affect	.18	.08	<b>.17*</b>
Gender In-Group Ties	.10	.08	.10
$R^2$	<b>.05**</b>		
<i>F</i> for change in $R^2$	5.125		
<i>N</i>	185		

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

Table 35

*Hierarchical Regression Analyses for Racial Identity Dimensions Predicting Racial PA Norms*

Variable	Step 1		
	<i>B</i>	<i>SE B</i>	$\beta$
Racial Centrality	-.06	.06	-.08
Racial In-Group Affect	.14	.07	.18
Racial In-Group Ties	-.01	.07	-.01
$R^2$		.033	
$F$ for change in $R^2$		2.065	
$N$		184	

Table 36

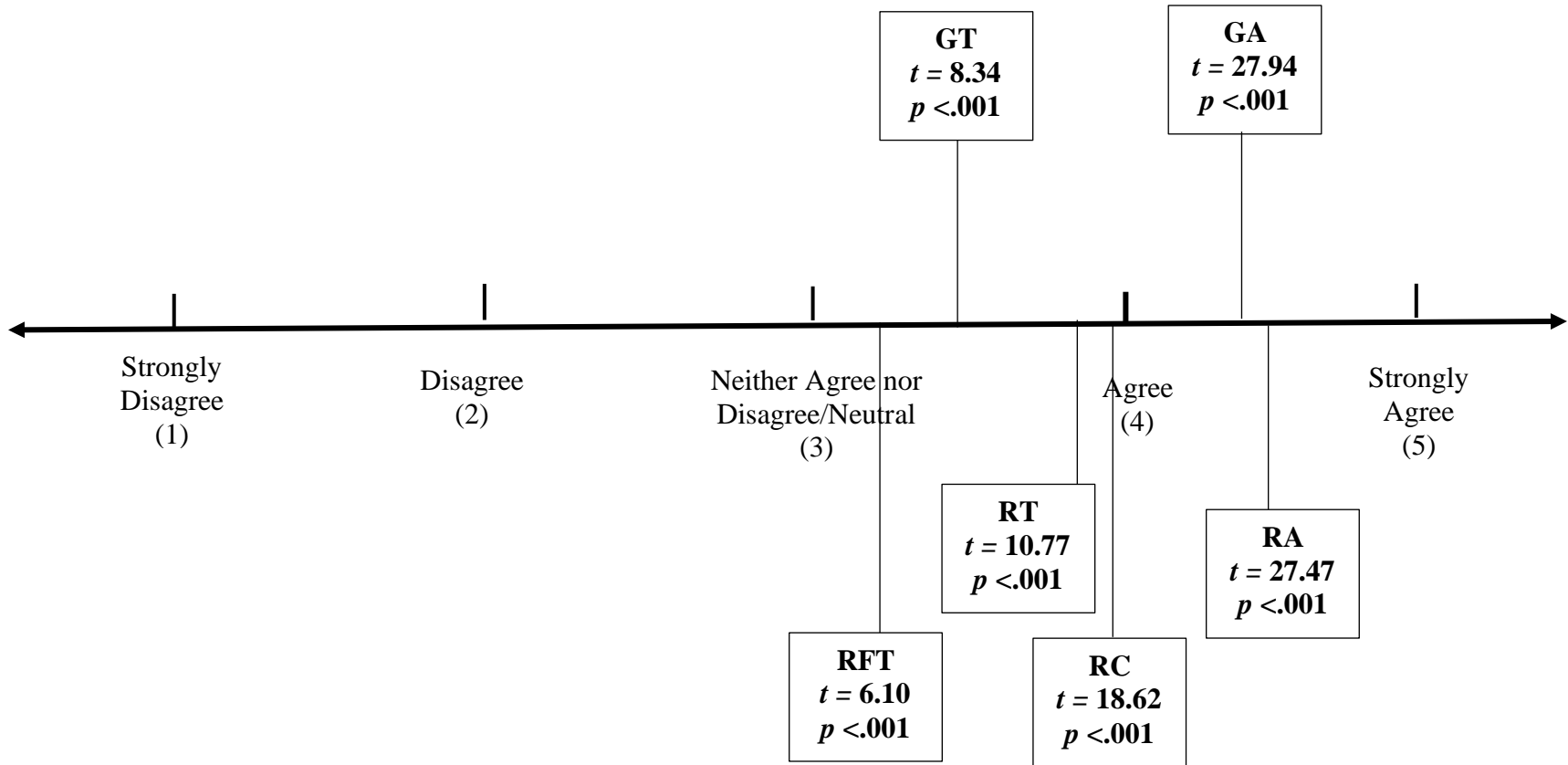
*Hierarchical Regression Analyses for Gender Identity Dimensions Predicting Racial Friend PA Norms*

Variable	Step 1			Step 2		
	<i>B</i>	<i>SE B</i>	<i>B</i>	<i>B</i>	<i>SE B</i>	<i>B</i>
Control <sup>a</sup>	-.55	.16	<b>-.25**</b>	-.53	.16	<b>-.24**</b>
Racial Centrality				.06	.07	.06
Racial In-Group Affect				.14	.08	.15†
Racial In-Group Ties				-.012	.08	-.01
<i>R</i> <sup>2</sup>		<b>.06**</b>			.09	
<i>F</i> for change in <i>R</i> <sup>2</sup>		12.21			1.731	
<i>N</i>		185			182	

Note. a Control variable was mother's education

\**p* < .05, \*\**p* < .01, †*p* = .05-.09.

Figure 3: Gender and Racial Identification



Note: GA = Gender In-Group Affect, GT = Gender In-Group Ties, RC = Racial Centrality, RIA = Racial In-Group Affect, RT = Racial In-Group Ties, RFT = Racial Felt-Typicality

Figure 4: Normative Perceptions of Physical Activity for Gender and Race

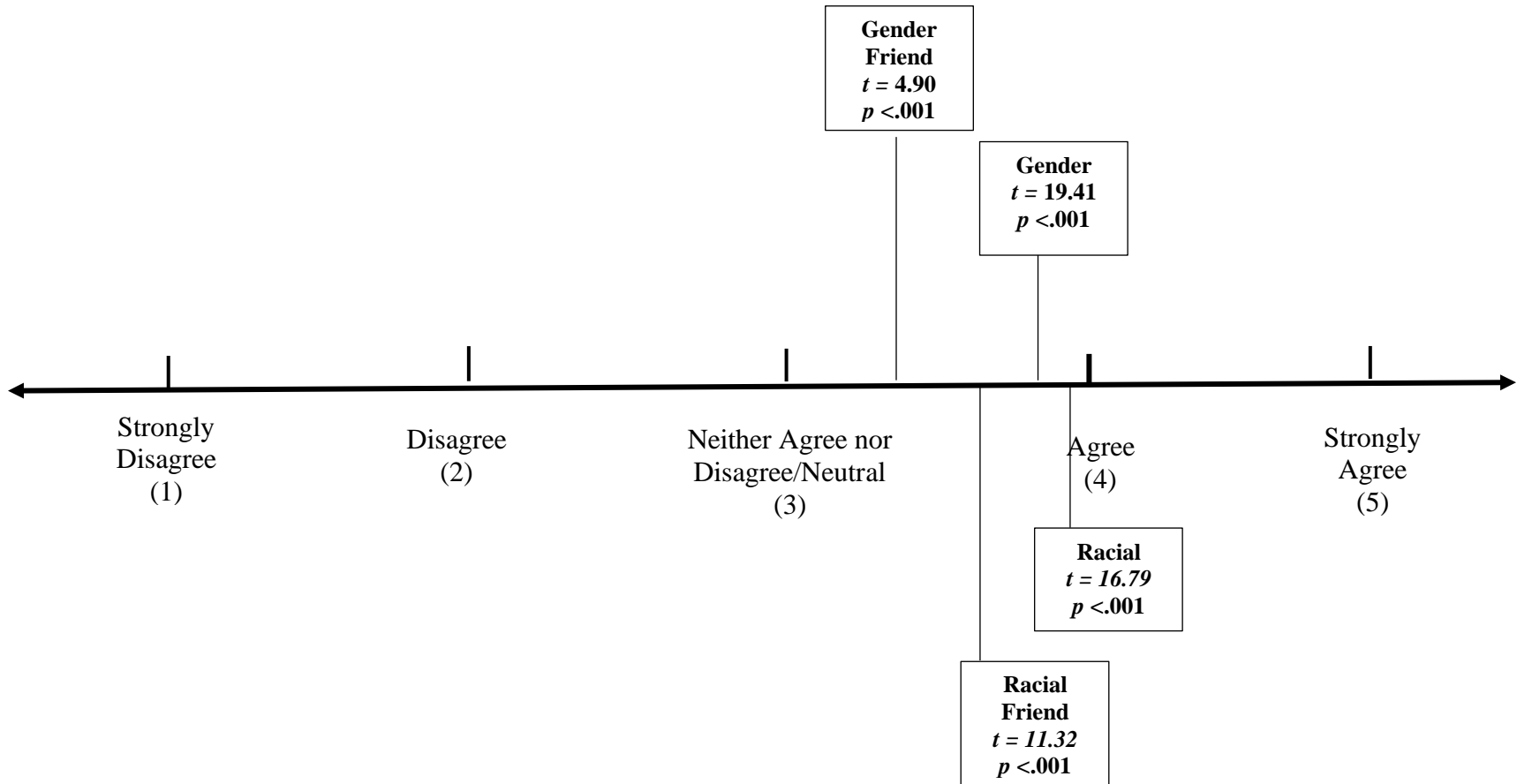


Figure 7: Physical Activity in the Context of Social Identity Theory-Gender Identity and Total MET Minutes Per Week

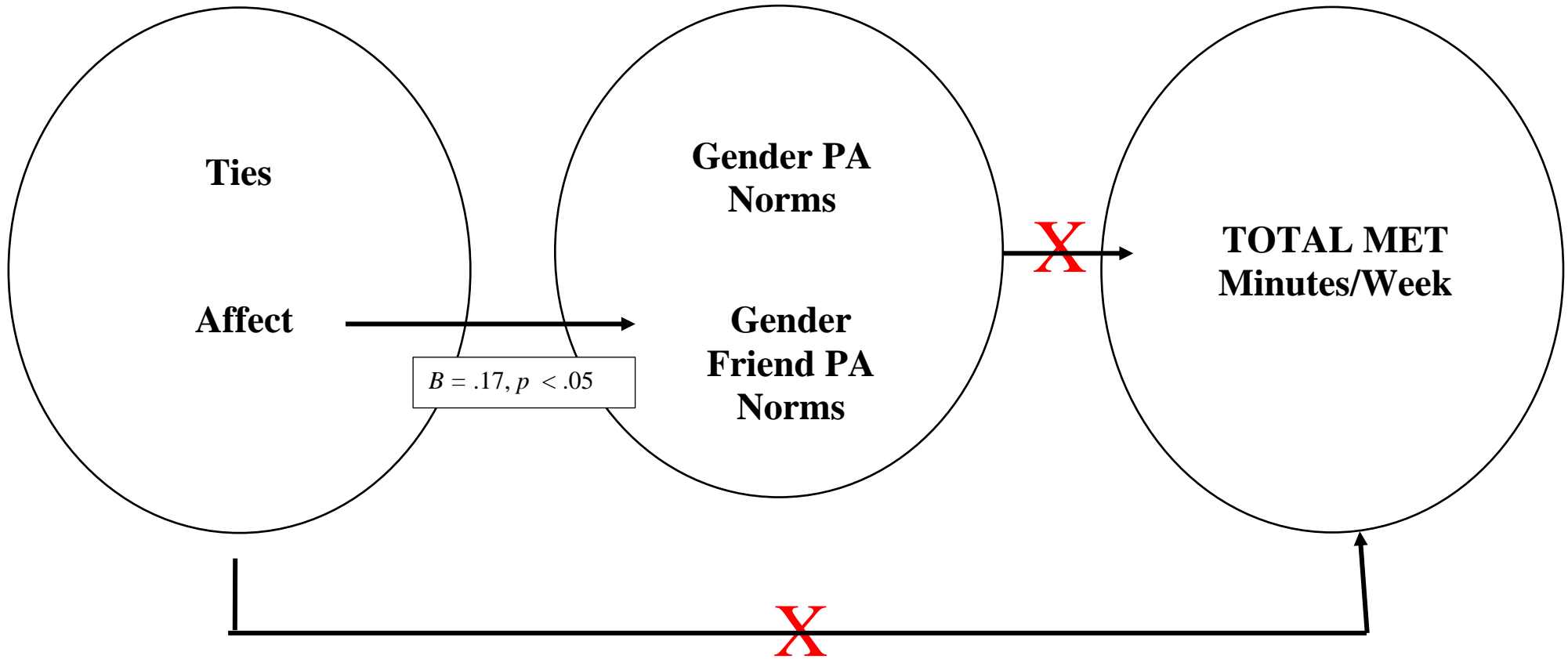


Figure 8: Physical Activity in the Context of Social Identity Theory-Gender Identity and Physical Activity Intensity

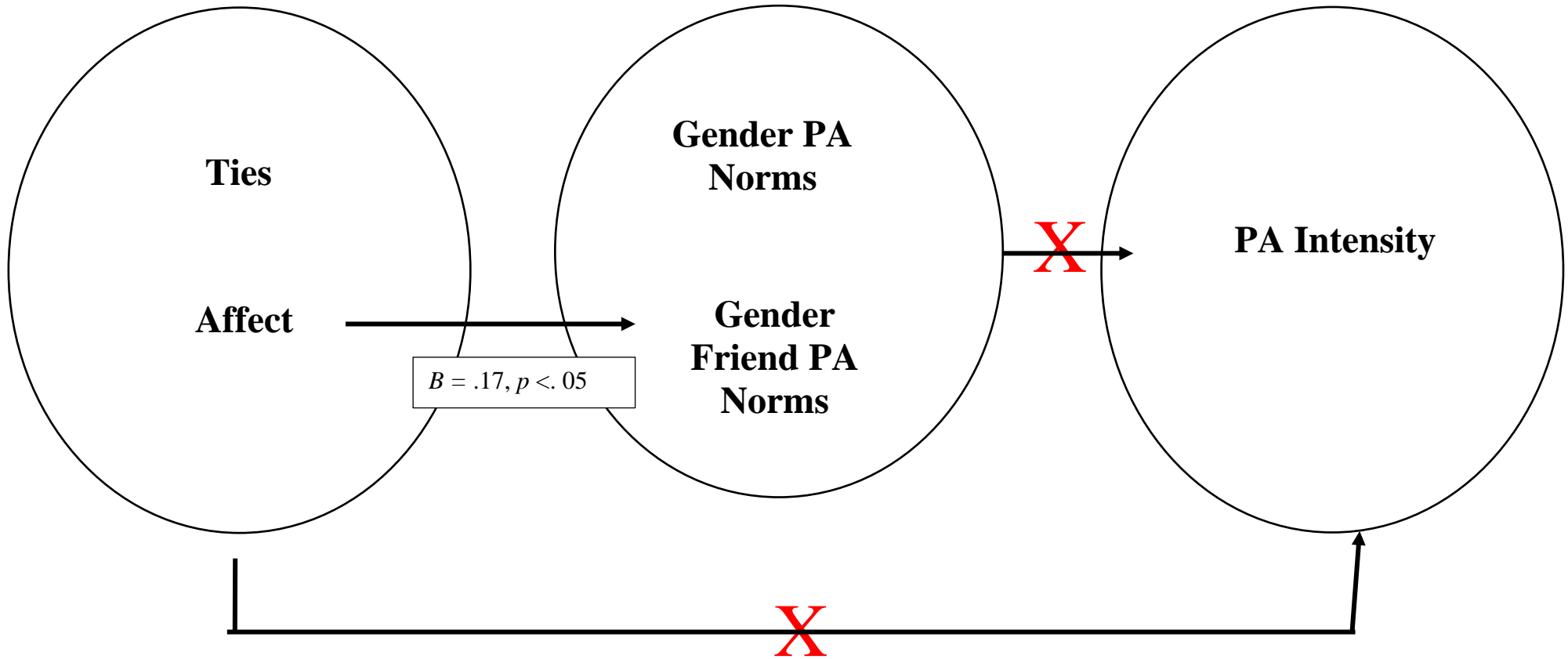


Figure 9: Physical Activity in the Context of Social Identity Theory-Racial Identity and Total MET Minutes Per Week

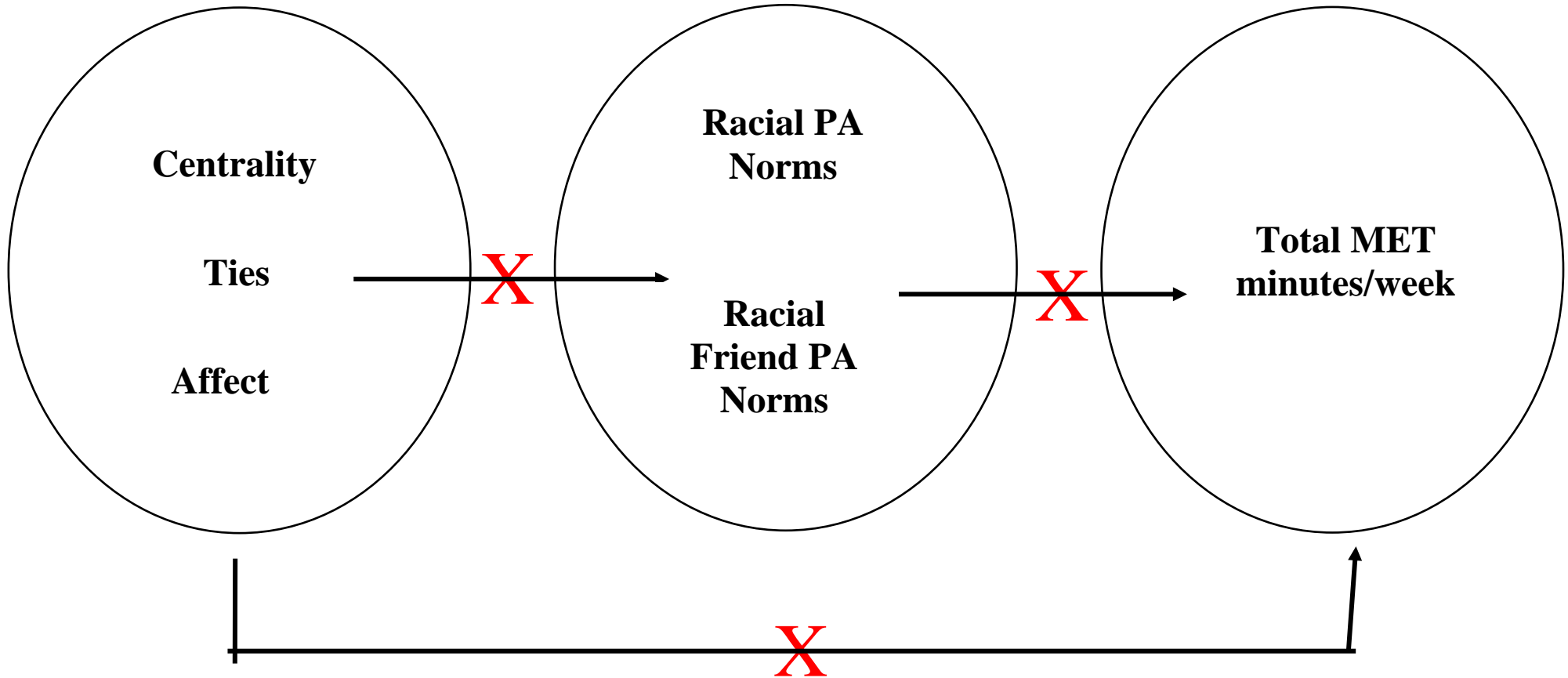


Figure 10: Physical Activity in the Context of Social Identity Theory-Racial Identity Physical Activity Intensity

