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# The effects of racially-motivated emotional arousal on the eating behaviors of african american women

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**THE EFFECTS OF RACIALLY-MOTIVATED EMOTIONAL AROUSAL ON THE  
EATING BEHAVIORS OF AFRICAN AMERICAN WOMEN**

by

**LENWOOD WILLIAM HAYMAN, JR.**

**DISSERTATION**

Submitted to the Graduate School

at Wayne State University,

Detroit, Michigan

in partial fulfillment of the requirements

for the degree of

**DOCTOR OF PHILOSOPHY**

2011

MAJOR: PSYCHOLOGY (Cognitive,  
Developmental, and Social)

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Advisor

Date

## DEDICATION

I dedicate this body of work to my son, Mateo, and to my wife, Dr. Alexandra C. Hayman. To Mateo, knowing that you will reap the benefits of my hard work has been a significant motivating factor to push through until the end of this project – even when this project pushed back. If nothing else comes from this paper, let this be an example of perseverance, dedication, courage, strength, and humility. When you look at your father’s work, know and internalize that this is only the tip of your iceberg. If I can do great things, then you can do *greater* things. Your mother and I are fortunately familiar with greatness and know that it can be a blessed acquaintance of yours as well.

To Ali, all I can say is thank you. Thank you for your love. Thank you for your support. Thank you for your dedication. Thank you for your understanding. Thank you, most importantly, for your love. I truly believe that I would not have been able to do this without you. Thank you. God bless you. I love you.

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## CHAPTER 1 – Introduction

Disparities between African Americans and Caucasians remain vast across a wide variety of health indicators. Caucasian men live, on average, 10.2 years longer than African American men and Caucasian women live, on average, 5.2 years longer than African American women (Bahr, 2007). African Americans have higher rates of morbidity and mortality than do Caucasians on 12 of the 15 major causes of death in the United States (Martin, Tuch, & Roman, 2003; Whitfield, Weidner, Clark, & Anderson, 2002). For example, African Americans experience higher rates of hypertension (26.7% vs. 20.1%; American Heart Association, 2005), diabetes (14.7% vs. 9.8%; National Institutes of Diabetes and Digestive and Kidney Diseases, 2008), and stroke (2.9% vs. 2.4%; American Heart Association, 2005) than do Caucasians. African Americans also have a higher prevalence of disability than do Caucasians (Barnes, Mendes-De Leon, Wilson, Bienias, Bennett, & Evans, 2004; Hayward, Miles, Crimmins, & Yang, 2000).

Numerous factors have been posited as possible causes of these health disparities. For example, about one-sixth (around 47 million) of the American population is uninsured (Quadagno, 2004). In addition, hundreds of millions of Americans have limited access to health-care services or are having trouble paying their health care bills, thus contributing, in part, to the disparate health of certain groups in the United States. For example, 10.8% of Caucasians were uninsured in 2008 in comparison to 19.1% of African Americans (U.S. Census Bureau, 2009). Another factor suggested to be a contributing factor to the health disparities between African Americans and Caucasians is socioeconomic status (D. R. Williams, Yu, Jackson, & Anderson, 1997). Childhood poverty, inadequate education, marginal employment, and low income are all

more likely to be features of the lives of African Americans than those of Caucasians (Myers, 2009; D. R. Williams & Mohammed, 2009).

Low socio-economic status makes it difficult to control everyday life circumstances such as social ties, diet, health-risk behaviors, the type of work one does, and the environment in which one works (Hayward et al., 2000). Lack of control has been indicated as one of the largest contributors to stress which, in turn, is one of the most significant catalysts to chronic illness (Brosschot, Godaert, Benschop, Olf, Ballieux, & Heijen, 1998; Peters, Godaert, Ballieux, et al., 1999). Stress not only causes physiological distress but also leads to biochemical, cognitive, and behavioral changes in the body that may have short- and long-term consequences for health (Baum, 1994). In recent years, chronic stress has been identified as a risk factor for a variety of chronic illnesses and poor health outcomes (Troxel, Matthews, Bromberger, & Sutton-Tyrrell, 2003). For example, studies have shown chronic stress to contribute to the development of cardiovascular disease (Troxel et al., 2003), hypertension (Clark, 2003), diabetes and having a fatal stroke (Karlamangla, Singer, & Seeman, 2006).

One type of chronic stress that has been linked to health disparities is the stress associated with experiences of racial discrimination (Bahr, 2007; Clark, Anderson, Clark, & D. R. Williams, 1999; Harrell, Merritt, & Kalu, 1998). Research suggests that the stress African Americans encounter as a result of their racist experiences contributes to a chronic elevation of their physiological stress response (Bahr, 2007; Myers, Anderson, & Strickland, 1998). As described in a later section, this elevated stress response is associated with a range of health problems for which African

Americans are severely disadvantaged, in particular, coronary heart disease, hypertension, and diabetes (Bahr, 2007; Myers et al., 1998).

In addition to stress, a major risk factor for coronary heart disease and diabetes is obesity (Centers for Disease Control and Prevention, April 2004), which has been established as a major health problem in the United States. Ogden, Carroll, McDowell, and Flegal (2007) analyzed data from the National Health and Nutrition Examination Survey and developed a report on obesity among adults in the United States. Results indicate that more than one-third of American adults (33.3% of men and 35.3% of women) were obese in 2005-2006 (Ogden et al., 2007). Data also indicate that although there were no racial and ethnic obesity disparities for men, there were for women. For example, African American and Mexican-American women were more likely to be obese than Caucasian women (Ogden et al., 2007). Specifically, previous research shows that over 53% of African American women are obese in comparison to almost 51% of Mexican-American women and 39% of Caucasian women (Ogden et al., 2007; Centers for Disease Control and Prevention, 2007). As a further illustration of their health risks, results indicate that African American women are also more physically inactive and have higher levels of mean total blood cholesterol than do African American men and Caucasian women and men (American Heart Association, 2005). Although treatment programs have low success rates for everyone, African American women have also been found to lose less weight than their Caucasian counterparts when enrolled in obesity treatment programs (Kim, Bursac, DiLillo, White, & West, 2009).

The literature suggests that obesity in African American women tends to be the result of psychosocial, behavioral, cultural, environmental, physiological, gender, and

genetic factors (Blanchard, 2009). However, there is a dearth of literature that focuses specifically on the contribution of racial discrimination-related stress to the disparate rates of obesity in African American women. Therefore, the current study was designed to investigate the possible psychosocial contributions of racism-related stress and the eating behaviors of African American women to their high rates of obesity. The remainder of this chapter describes the relevant research and the study's hypotheses.

### **Definitions of Racism and Racial Discrimination**

Despite the best efforts of individuals advocating for civil rights, legislation being established, and even the election of the first African American President of the United States, racism is indeed "alive and ill" in America (Harrell, 2000). Exemplified in racially motivated hate crimes, racial incidents on college campuses, wide-spread acceptance of anti-immigrant sentiments and political action, and the multi-media support of messages of racial intolerance (both indirect and overt), racism is still a pervasive aspect of American life.

Although numerous definitions of racism exist in the literature, most focus on the underlying notion of power. For example, Harrell (2000) defines racism as:

A system of dominance, power, and privilege based on racial-group designations; rooted in the historical oppression of a group defined or perceived by dominant-group members as inferior, deviant, or undesirable; and occurring in circumstances where members of the dominant group create or accept their societal privilege by maintaining structures, ideology, values, and behavior that have the intent or effect of leaving nondominant-group members relatively

excluded from power, esteem, status, and/or equal access to societal resources.

(p.43)

D. R. Williams and Williams-Morris (2000) suggest that racism “refers to an organized system that leads to the subjugation of some human population groups relative to others” (p.244). They further assert that the system of racism is based on an “ideology of inferiority in which human population groups are categorized and ranked with some being inferior to others” (p. 244), often supported by the vehicles of stereotypes, prejudices, and racial discrimination (D. R. Williams & Williams-Morris, 2000).

Whereas stereotypes and prejudices are viewed as the more cognitive and affective aspects of racism, racial discrimination – unfair treatment of racial outgroups by both individuals and social institutions (Harrell, 2000; D. R. Williams & Williams-Morris, 2000) – is the outward expression of racist thoughts. Without this outward expression of racism, D. R. Williams and Williams-Morris (2000) theorize that racism could only exist at the individual level, and not on the societal level. Although overt demonstrations of racial prejudice and discrimination are considered socially taboo, racial discrimination still endures covertly in the housing and labor markets, as well as in the criminal justice and education systems (D. R. Williams & Mohammed, 2009). Therefore, because racism is so deeply rooted in American society, racial discrimination can be experienced directly, vicariously, institutionally, collectively, and transgenerationally (Harrell, 2000).

### **Prevalence of Racial Discrimination**

In the United States, African Americans consistently make the most frequent reports of racial discrimination (D. R. Williams & Mohammed, 2009). For example, in a

community study of 1,139 Blacks, Whites, Asians, Native Americans, and Hispanic adults, D. R. Williams and colleagues (1997) found African Americans reported the most experiences of racial discrimination. In comparison to the other ethnicities sampled, African Americans were twice as likely to report having had at least two racist experiences and six times as likely to report having had three racist experiences over their lifetime (D. R. Williams et al., 1997).

Other surveys also demonstrate that African Americans experience high rates of racial discrimination (Broman, Mavaddat, & Hsu, 2000; Klonoff & Landrine, 1999; Sydell & Nelson, 2000). Klonoff and Landrine (1999) conducted a survey which included 520 African Americans between the ages of 18 and 79. More than 70% reported that they had been discriminated against by teachers, employers, institutions, individuals in service jobs, or strangers. Ninety-six percent reported being victimized by racial discrimination within the past year.

Sydell and Nelson (2000) asked a primarily African American ( $n = 54$ ) and Caucasian ( $n = 54$ ) sample of college students to report how frequently they had experienced racial discrimination in their lives. Fifty-seven percent of African American respondents answered “occasionally,” as did 28% of Caucasians. However, most Caucasians (69%) chose “rather infrequently” or “almost never”, as compared to 24% of African Americans. Relatedly, Broman, et al. (2000) found that approximately 60% of the 495 African Americans in their study reported that they had been victimized by racial discrimination in the past three years. In addition, results from Broman and colleagues (2000) also indicated that those participants that reported these racist experiences also reported lower levels of mastery and higher levels of psychological distress.

Each of the above-mentioned studies demonstrates racial discrimination to be a common occurrence in the lives of most African Americans. Research further suggests that the chronic nature of racial discrimination make it a consistent stressor to the lives of African Americans (Brondolo, ver Halen, Pencille, Beatty, & Contrada, 2009). Widely referred to as racial discrimination-related stress, researchers suggest this to be an important contributing factor to the negative health occurrences some African Americans experience (D. R. Williams & Mohammed, 2009).

### **Racial Discrimination-Related Stress**

Although all sociodemographic groups in the United States experience life stressors (e.g., death of a loved one, divorce, job loss, bankruptcy, foreclosure, etc.), racial minorities must also navigate through their experiences of the unique person-environment interactions centered around their race (Harrell, 2000). In her comprehensive paper on the conceptualization of racism-related stress, Harrell (2000) asserts that it is a multidimensional construct that can result from racism experienced interpersonally (i.e., direct and vicarious interactions with other people), collectively (i.e., disparities in educational achievement, unemployment rates, incidence and prevalence of disease, and treatment in the criminal justice system), cultural-symbolically (i.e., societal acceptance of the individual attitudes, institutional practices, and common values of the dominant culture as expressed through art, entertainment, and science), and socio-politically (i.e., the nature of political debate and public discussion of race, racial ideology, and the institutionalization of policies, practices, and legislation). Specifically, she defines racism-related stress as:

The race-related transactions between individuals or groups and their environment that emerge from the dynamics of racism, and that are perceived to tax or exceed existing individual and collective resources or threaten well-being.

(Harrell, 2000, p. 44)

Seaton (2003) offered a more concise definition of racial discrimination-related stress, labeled in her research as race-related stress, which she defined as “the psychological discomfort that results from a situation appraised as troubling because of racism, racial prejudice, racial discrimination, or racial isolation” (p. 293).

Harrell (2000) further suggests that there are six types of racism-related stressors: Racism-related life events (e.g., infrequently occurring events like housing discrimination or racial profiling); vicarious racism experiences (i.e., racism experienced by close friends, family members, and strangers); daily racist microstressors (i.e., subtle and unconscious degradations that serve as daily reminders of the salience of race); chronic-contextual stress (i.e., perceptions of unequal distributions of resources for all African Americans); collective experiences (i.e., perceptions of racism’s effects on particular ethnic groups, such as stereotypic portrayals in the media); and transgenerational transmission (i.e., the history of a particular ethnic group and its relation to the dominant group in a particular society).

As mentioned above, racial discrimination is an aspect of racism. Therefore, the stress one experiences as the result of racism can be considered the same as the stress one would experience from experiencing racial discrimination. The current study focused specifically on the effects of racial discrimination, therefore racism-related



stress will be referred to as racial discrimination-related stress throughout the remainder of this dissertation.

Studies on the effects of racial discrimination-related stress have primarily focused on racism-related life events, vicarious racism experiences, and, to a lesser extent, daily racist microstressors. For example, in an overall review of the topic, D. R. Williams, Neighbors, and Jackson (2003) found that 20 of the 25 reviewed studies reported a positive association between racial discrimination and stress. In a longitudinal study of 897 African American families from Iowa and Georgia, Gibbons, Gerrard, Wills, and Brody (2004) found that 91% of their sample reported having had some type of discriminatory experience in the past. Furthermore, participants who reported frequent discriminatory experiences also reported high levels of stress. This relationship was maintained even after controlling for other possible contributors (i.e., negative life events, financial hardship, and romantic relationship stress), which suggests that reports of stress were primarily based on perceptions of racial discrimination for this sample.

As racism has evolved from more overt, direct, and intentional practices into a more subtle, indirect, and often disguised form, theorists suggest that research should follow a similar pattern (Solórzano, Ceja, & Yosso, 2000; Sue, Capodilupo, Torino, et al., 2007). Perhaps Pierce (1974) put it best when he posited, “One must not look for the gross and obvious; the subtle, cumulative ‘miniassault’ is the substance of today’s racism” (p. 516). In further support of this notion, Kennedy (1989) asserted that “although overt forms of racial domination [have historically proven to be] enormously destructive, covert color bars have been, in a certain sense, even more insidious”

(p.1752). As such, this dissertation was designed to focus specifically on the effects of daily racist stressors, also known as racial microaggressions.

*Racial Microaggressions.* Initially described by Pierce and colleagues (Pierce, Carew, Pierce-Gonzalez, & Willis, 1978), as “subtle, stunning, often automatic, and nonverbal exchanges which are ‘put downs’ of Blacks by offenders” (p. 66), racial microaggressions have increasingly become the focus of researchers studying the effects of racial discrimination-related stress on the health of minorities in the United States. More recent definitions of racial microaggressions describe them as “subtle insults (verbal, non-verbal, and/or visual) directed toward people of color, often automatically or unconsciously” (Solórzano et al., 2000, p. 60) and as “brief, everyday exchanges that send denigrating messages to people of color because they belong to a racial minority group” (Sue et al., 2007, p. 273). They are not limited to individual interpersonal encounters alone but may also be perpetuated in the environment, as when a person of color is exposed to an office setting that unintentionally assails his or her racial identity (Sue et al., 2007). As such, Pierce and colleagues (1978) further suggest that these offensive mechanisms used against minorities are often seen by the perpetrator as innocuous, thereby causing the cumulative weight of the victim’s never-ending burden from these microaggressive experiences to serve as the major ingredient in interracial interactions.

Perpetrators of microaggressions can usually explain their actions as banal and trivial using seemingly nonbiased and valid reasons. On the other hand, victims are always left with the nagging question of whether or not the negative experience was racially-motivated. Sue, Capodilupo, and Holder (2008) warn that although

microaggressions may represent “small acts”, it is the cumulative nature of these powerfully demeaning messages that causes the most harm to the victims. As such, racial microaggressions have serious consequences for both the perpetrator and the victim as they can create a negative racial climate that impedes harmonious race-relations and can also lead to an increase in feelings of self-doubt, anger, frustration, and mistrust in the victims (Solórzano et al., 2000).

When minorities experience microaggressions, they are usually placed in a “Catch-22” type situation as they struggle with the decision to respond and directly address the perpetrator, or to ignore it, which could ultimately lead the victims to experience feelings of pent-up anger and frustration (Sue et al., 2007). In turn, the victims are put in a “damned if I do, damned if I don’t” situation. Addressing the microaggressor directly could lead to negative consequences, such as being perceived as too racially sensitive or paranoid, which could translate into social ostracism. However, the emotional costs associated with consistently choosing to ignore the event could harm physical and mental health (Sue et al., 2007; 2008).

Solórzano and colleagues (2000) conducted focus groups with 34 African American students attending three, predominantly White, Research I universities in the United States. These students reported microaggressive behaviors by their White professors that negated their contributions, communicated low expectations, and often excluded their participation in school activities. Consequently, these students reported strong feelings of self-doubt and low self-esteem, as well as constantly feeling psychologically depleted, which they believed led them to perform worse than their White counterparts in the classroom (Solórzano et al., 2000).

Sue and colleagues (2008) found similar findings in focus group research with 13 African American men and women graduate students attending a school of education and psychology in the New York City metropolitan area. For example, participants reported that experiencing racial microaggressions made them feel intellectually inferior and incompetent simply because of their skin color, resulting in an overall sense of powerlessness due to the fact that their racial realities are constantly shaped by White people, whom they believe hold the power to define racially microaggressive situations in nonracial terms. In other words, participants expressed feeling like they had little control over stopping the daily barrage of racial microaggressions they experience, since the White perpetrators' interpretations of the events seem to be what matters most. Several participants reported that their frequent experiences with racial microaggressions left them feeling invisible. They also did not feel like they belonged because their opinions and intellectual abilities were viewed by society as less worthy of recognition than a White person's. These feelings of social exclusion and situational invisibility have been conceptualized as ostracism (see K. D. Williams, 2007).

### **Social Ostracism**

Research suggests that it is important for people to belong to a social group (see Baumeister & Leary, 1995 for a review). Individuals tend to develop this need early in infancy in the form of attachment behavior and continue to exhibit a strong need to belong across their lifespan (Bowlby, 1969, 1973). Care, support, positive health outcomes, and reproduction are all benefits available to individuals who maintain a strong social network (Ainsworth, 1989; Berkman, Glass, Brissette, & Seeman, 2000). However, individuals lacking such ties to social groups, via ostracism, tend to find the

experience aversive and stressful. The Merriam-Webster Online Dictionary (2010) defined ostracism as “exclusion by general consent from common privileges or social acceptance.” In the literature, ostracism has been defined as “being ignored and excluded, often occurring without excessive explanation or explicit negative attention” (K. D. Williams, 2007, p. 429).

In laboratory studies, individuals who are excluded by others perform worse on a variety of cognitive tasks and express more negative affect than do individuals who are included by others (Baumeister, Twenge, & Nuss, 2002; Gonsalkorale & K. D. Williams, 2007; Leary, Twenge, & Quinlivan, 2006; Smith & K.D. Williams, 2004). K. D. Williams (1997, 2001) designed a theoretical model to study the multiple forms of ostracism and the potential effects it has on those who are ostracized. The central tenet of this model is that being ostracized threatens what K. D. Williams (1997, 2001) describes as the four fundamental human needs: belonging, control, self-esteem, and meaningful existence.

An emotional consequence of ostracism is a feeling of separation, as targets are actively denied any further connection to the ostracizing individual(s). According to K. D. Williams (1997, 2001), one’s sense of belonging is threatened when ostracized. Targets of ostracism are seldom presented a reason for their exclusion, usually rendering them unable to defend themselves in response to such negative treatment. Thus, ostracized individuals usually feel a lowered sense of control and self-esteem as they internally attribute the cause of their treatment (K. D. Williams, 1997, 2001). K. D. Williams (1997, 2001) further suggests that being ostracized could also provide targets with an idea of what life would be if they did not exist. Although perhaps an exaggerated by-product of

being made to feel as if they no longer belonged in a particular environment or in the presence of certain groups of people, targets usually easily attribute their treatment to themselves and being out of their control.

To test this theory in the laboratory, K. D. Williams (1997) designed study procedures to expose participants to a relatively mild form of ostracism in a controlled setting. In this paradigm, participants arrive at a research laboratory and find two other participants, who are actually confederates, waiting to participate in the same study. While waiting for the experimenter to return, one of the confederates notices a ball and starts tossing it around to both the participant and the other confederate. Participants randomly assigned to the ostracism condition are thrown the ball only a few times at the beginning and are subsequently ignored and excluded as the two confederates continue playing for approximately four more minutes. In the inclusion condition, the confederates continue to throw the ball to the participant throughout this time interval.

K. D. Williams, Cheung, and Choi (2000) developed a paradigm that allowed examination of the effects of ostracism in a virtual environment. Participants are informed online that they will engage in an exercise of their mental visualization abilities via a game called Cyberball. In this game, participants are told that they will play a virtual game of catch with two (sometimes three) other participants to whom they are linked via the study website. They are further instructed to pay less attention to how often they catch and to whom they throw the ball, but instead to visualizing specific aspects of the interaction such as the other players, the location of the game, etc. The primary purpose of this cover story is to distract participants from the actual purpose of the study. Similar to the in-lab ball-tossing paradigm, as compared to included

participants, ostracized participants are thrown the ball substantially fewer times, often only at the beginning of the game. Specifically, ostracized participants only receive the ball twice (or three times if playing with three other participants) out of a total 30 to 50 throws.

These procedures and findings have been replicated across numerous laboratory studies, thereby demonstrating that brief exposure to ostracism by strangers in the lab is consistently associated with negative self-perceptions (for a review, see K. D. Williams, 2009). After the initial face-to-face studies, K. D. Williams and colleagues (2000) conducted a 2 study investigation on the effects of being ostracized over the Internet and how targets cope with this form of ostracism. In Study 1, 1,486 participants logged into a website to engage in a study on “the utility of the computer as a tool in mental visualization” (p. 751). After completing demographics and self-esteem questionnaires, participants played Cyberball with two other computer-controlled “players”. Participants were thrown the ball by the other players and were instructed to click on the icon representing the position of the player to whom they wanted to throw the ball. After catching and throwing the ball one time, participants were randomly assigned to one of four conditions: overinclusion, in which they received the ball 67% of the time; inclusion, in which 33% of the throws went to them; partial ostracism, in which only 20% of the throws went to them; and complete ostracism, in which none of the throws went to them for the duration of the game. After the sixth throw, which was presumed to be long enough for the ostracism manipulation to be perceived, the game continued as long as the participants chose to continue. Results indicate that as ostracism increased, so did perceptions of the aversiveness of the game. Although

perceived control and meaningful existence were not influenced by the amount of ostracism; belongingness and self-esteem were significantly lowered as ostracism increased.

In Study 2, K. D. Williams and colleagues (2000) extended the ostracism paradigm by examining whether the psychological consequences of ostracism were greater if the target were excluded by sources belonging to their ingroup versus being excluded by sources belonging to their outgroup. Participants logged onto a website to engage in an experiment designed to compare the perceptual abilities of PC versus Mac users. As in Study 1, participants were told to mentally visualize the game as it took place as this would help them in a subsequent task they were to perform later in the experiment. After indicating the computer platform they preferred to work with most, in order to create the ingroup versus outgroup distinction, participants played the game with two PC users, two Mac users, or 1 PC and 1 Mac user. Different from Study 1, the game only lasted for 10 ball tosses, with no option to quit and with only two levels of ostracism: inclusion, in which they received the ball as often as did the other players; and exclusion, in which they received the ball only three times. There were main effects of ostracism such that excluded participants reported lower feelings of belonging than did included participants. Results further suggest that participants who were excluded by either the out-group or the mixed-group reported lower belonging than their included counterparts; whereas participants either excluded or included by in-group members did not report significantly different levels of belonging. This study suggests that the Cyberball paradigm can also be useful in studies examining intergroup relations.



K. D. Williams, Govan, Crocker, et al. (2002) found similar results in a replication of the above mentioned study. In this experiment, 390 participants logged onto a website and were informed they would take part in a mental visualization task examining Internet users' visualization skills. As in K. D. Williams et al. (2000), participants interacted with two other computer-programmed players. However, unique to this study, participants were led to believe that the two other players were either friends or strangers, with the expectation that the negative effects of ostracism would be reduced when the other two players knew each other and, therefore, had a reason to favor each other. Also different from K. D. Williams et al. (2000), Cyberball in this study lasted for 15 throws, with included participants receiving the ball 5 times and excluded participants only once. There were main effects of ostracism such that excluded participants reported significantly lower levels of belongingness, control, self-esteem, and meaningful existence than did included participants. However, no significant differences were found between participants who thought they played the game with two friends or two strangers, thereby calling into question the idea that the reason for the ostracism affects targets' response.

This question was addressed by Zadro, K. D. Williams, and Richardson (2004) in their two-study investigation into the effects of being ostracized by a computer versus a human. In Study 1, 80 undergraduates were told they would be playing Cyberball with either two other students participating in the same experiment at a different location, or against two other computer-controlled players. The games in this study lasted for 40 throws, with included participants receiving approximately one-third of the throws and excluded participants only twice receiving the ball. Results indicate that excluded

participants reported significantly lower levels of each of K. D. Williams and colleagues (2000) measures of four fundamental needs than did included participants, regardless of whether they thought they were playing against other people or a computer.

In Study 2, Zadro et al (2004) examined the hypothesis that providing a reason for the ostracism would reduce its negative effects. Seventy-seven undergraduate students followed Cyberball procedures similar to those in Study 1. However, Study 2 participants were further instructed that the two other players, whether human or computer-controlled, were either following a script or performing unscripted. Results again indicated main effects for ostracism such that the excluded participants reported significantly lower levels of belongingness, control, self-esteem, and meaningful existence. Ostracized participants also reported significantly worse moods than did included participants. No significant main effects were found for ostracism source (computer vs. human), nor for attribution choice (scripted vs. unscripted). These findings suggest that ostracism hurts regardless of the source or the source's motives.

Gonsalkorale and K. D. Williams (2007) extended these results in their research on the effects of being ostracized by a despised outgroup. Ninety-seven introductory psychology students from an Australian university were recruited to participate in a study investigating the personality of people who support diverse groups within Australia. Participants were asked to indicate their preference toward one of three groups: the Australian Labor Party (Labor Party), the Liberal Party of Australia (Liberal Party), or the Imperial Klans of Australia (KKK). These three groups were meant to represent the two largest political parties and one of the most despised groups in Australia, respectively. Participants were then randomly assigned to play Cyberball with

two other people belonging either to their ingroup, their rival outgroup, or to their despised outgroup. For example, if the participant indicated a preference towards the Liberal Party, their rival outgroup was the Labor Party and the despised outgroup was KKK supporters. Participants were reminded of the other players' group affiliations by on-screen icons positioned next to the Cyberball characters. Participants were either included, receiving the one-third of the throws, or excluded, receiving the ball only once in the beginning of the game. Results indicate main effects for inclusion, such that ostracized participants reported feeling significantly more excluded and ignored than did included participants. Excluded participants also reported worse moods, as well as lower levels of belonging, control, self-esteem, and meaningful existence than did included participants, regardless of the source of the ostracism. In other words, results suggest that ostracism was no less emotionally harmful coming from a member of a despised outgroup than from a member of one's ingroup.

Gonsalkorale, Carter-Sowell, Sloan, and K. D. Williams (2008) later replicated these findings with a sample of African American students attending a historically Black college in the United States. Despite knowing the hatred the American Ku Klux Klan has for African Americans and vice-versa, participants ostracized by players thought to be KKK supporters were no less emotionally affected than were participants ostracized by other African Americans.

Recently, researchers have begun to investigate the links between social ostracism and discrimination. Studies have examined the effects of ostracism on groups with a history of being marginalized, ignored, and excluded in the United States. Wirth and K. D. Williams (2009) examined the effects of ostracism on individuals holding a

group membership. They argued that a group membership should provide ostracized individuals with the opportunity to attribute their ostracism to discrimination; thereby either protecting them from negative emotional outcomes or intensifying the psychological harm. Two hundred thirty-three participants engaged in a study in which their group membership was either ignored or highlighted to varying degrees by the Cyberball icons. Specifically, participants' Cyberball player either depicted no group membership, in which they appeared the same as the other players, a temporary group membership, where participants were a different color (either blue or green) than the other players, or a permanent group membership where participants were a different gender than the other players. In the permanent group membership condition, the participant's Cyberball avatar reflected their own gender, while the other players were the opposite gender. Gender was manipulated by depicting the female players as having long hair and wearing a skirt, while the male players had no hair and wore shorts. After playing the game, participants completed the Cyberball measures both immediately afterward, and later on in the experiment.

Wirth and K. D. Williams (2009) found the standard main effects for ostracism, demonstrating that ostracized participants felt worse than did included participants. More importantly, they also found that ostracized participants who were part of a permanent group demonstrated a more prolonged lowered sense of belonging, control, self-esteem, and meaningful existence than those ostracized who possessed a temporary group membership. These results suggest that being ostracized for a more stable and central aspect of one's identity thwarted recovery of basic need satisfaction

and mood compared to being ostracized for a temporary and peripheral aspect of identity (Wirth & K. D. Williams, 2009).

Goodwin, K. D. Williams, and Carter-Sowell (2010) extended this research further in their research on the effects of attributing ostracism to racial discrimination. In a study of over 600 White and African American adult men and women, they found that the race of the source influences targets' emotional responses. There was an interaction of race and ostracism such that excluded Whites and African Americans felt worse than included Whites and African Americans; however excluded African Americans felt worst. Furthermore, excluded White participants recovered their fundamental needs quickly regardless of whether they were excluded by Whites or African Americans. However, African American participants excluded by White players took longer to recover their fundamental needs than did those who were excluded by African Americans. Lastly, results indicate that African Americans more consistently attributed their ostracism to racial discrimination than did White participants. These findings suggest that for African Americans, the source of ostracism does matter, especially when they are ostracized by White participants.

Collectively, these studies demonstrate the usefulness of using the Cyberball paradigm as a laboratory operationalization of racial microaggressions (Goodwin et al. 2010; Wirth & K. D. Williams, 2009). In addition, there are few studies that investigate how racial minorities cope with the effects and perceived stressfulness of being ostracized. This dissertation was designed to address these gaps in the literature by examining how exclusion in the Cyberball game affects African American women.

## **The Relationship between Racial Discrimination-Related Stress and Health**

It is difficult to cope with the stressfulness of racial discrimination, primarily due to the complex nature of the construct (Barnes & Lightsey, 2005). Just as specific features of racist experiences can differ according to the physical, social, and temporal contexts of the event, so too will the coping demands (Brondolo, ver Halen, et al., 2009). The targets of racism must have a range of coping resources to manage the practical and emotional aspects of the resulting stress, which, as a result of limited environmental conditions, might not always be readily available. As is the case for all chronic stressors, victims of racial discrimination must learn to cope with the substance of racist events (e.g., interpersonal conflict, blocked opportunities, social exclusion) and develop skills to manage the emotions associated with the experience and their physiological correlates (Utsey, Adams, & Bolden, 2000). Racial discrimination has both direct effects (i.e., through access to healthy diets and appropriate medical care) and indirect effects (i.e., through stress, psychosocial resources, and emotions) on the health status of Blacks (Brondolo, Gallo, & Myers, 2009).

There is also some evidence for health disparities, with stress contributing to stronger negative physiological health effects for African Americans than for Caucasians. For example, Troxel, Matthews, Bromberger, and Sutton-Tyrrell (2003) evaluated risk factors for the early development of cardiovascular disease (CVD) in 334 African American and Caucasian women. Results indicated that the combined stress from life events, ongoing stressors, economic hardship, and unfair treatment was associated with a greater average carotid artery intima-media thickness (IMT) in the African American women than in their Caucasian counterparts. There was a positive

linear relationship between the number of stressors reported and the mean IMT among African American women, but not for Caucasian women. The study's authors suggested that these findings were due to African Americans' greater exposure to chronic stress (Troxel et al., 2003).

Research has also linked racial discrimination-related stress and hypertension (Brondolo, Rieppie, Kelly, & Gerin, 2003; Clark & Gochett, 2006; Krieger & Sidney, 1996). Krieger and Sidney (1996) conducted a seven-year longitudinal, community-based study of 4,086 African American and Caucasian women and men between 25 and 37 years old. Information was obtained on participants' experiences with racial discrimination, overall unfair treatment, responses to this unfair treatment, and blood pressure. Eighty percent of the 1,974 African Americans in their sample reported experiences with racial discrimination and other types of unfair treatment, compared to only 29% of the Caucasians. African Americans also had higher blood pressure than the Caucasians in this sample. Results show that for the African Americans in this sample, blood pressure was linked to their reported experiences with racial discrimination. Specifically, results indicate that those African Americans who reported the most experiences with racial discrimination also had higher blood pressure than those who reported fewer racist experiences.

Results from Clark and Gochett (2006) suggest the susceptibility to hypertension in African Americans could start as early as the sixth grade. In their sample of 217 eleven-year old African American boys and girls, 71% reported having already experienced racism. Although perceptions of racism was not an independent predictor of blood pressure for these youth, racist perceptions were associated with elevated

levels of blood pressure in those who were more likely to accept racism as a fact of life (Clark & Gochett, 2006).

D. R. Williams and Williams-Morris (2000) reviewed United States-based research on the ways in which racism can affect mental health. An emerging theme from their overview was that perceptions of racial discrimination are related to higher levels of psychological distress and lower levels of life satisfaction and happiness. Sellers, Caldwell, Schmeelk-Cone, and Zimmerman (2003) found that stress is one of the pathways through which racial discrimination affects mental health in a study of 555 African American academically at risk ninth-graders. Longitudinal data demonstrated that everyday racial hassles made life more stressful for these youth. This stress, in turn, was associated with high levels of anxiety and depression at a later timepoint.

### **The Relationship between Stress and Obesity among African Americans**

Obesity is considered an epidemic in the United States, especially for minority populations. African American women, have the highest rates of obesity across all ethnic groups in the United States (Blanchard, 2009). Bahr (2007) makes a strong case for links between racial discrimination stress and obesity among African Americans. He reasons that the chronic stress African Americans endure as a result of their racist experiences depletes the physiological stores of essential nutrients, while simultaneously increasing the physiological demand for them. The traditional African American diet is high in fat, which creates a barrier to healthy replenishment of the nutrients depleted by stress (Bahr, 2007).

Cultural norms also contribute to the high rates of obesity among African American women (Sims, Gordon, Garcia, Clark, Monye, Callender, & Campbell, 2008).



As traditional cooks in the family, African American women have more exposure to the high fat foods that are prepared than do African American men. However, as “family chef” is a common gender role for women from other ethnicities as well, this aspect is believed to work in conjunction with stress, rather than independently, to contribute to obesity in African American women (Airhihenbuwa & Kumanyika, 1996).

The lifestyles of many African American women predispose them to excessive weight gain. For example, not only are African American women more socially accepting of being overweight, but their culture also encourages them to generally perceive themselves as healthy and beautiful despite being overweight (Gore, 1999; Thompson, 2006). They also experience less social pressure to diet and exercise, are less physically fit, and do not view weight as an issue for participating in sex, exercise, or sports (Gore, 1999; Thompson, 2006). African American women are 50% more likely than Caucasian women to experience a major weight gain in 10 years and 60% more likely to become obese (Blanchard, 2009).

Research suggests that the influence of chronic stress on developing illness and disease is exacerbated if the stress is coped with via a high-fat diet and less frequent exercise (Ng & Jeffery, 2003). As the economic constraints many African Americans experience can lead to the consumption of a higher percentage of calories from less-expensive fatty meat, fewer fruits and vegetables, less dietary fiber, and fewer dairy products, it becomes clear why they suffer to such a great extent from obesity (Blanchard, 2009; Browning & Cagney, 2002, 2003).

## Individual Differences in Food Consumption in Response to Stress

Some individuals turn to food for psychological comfort during times of stress. Research shows that stress affects eating in a bidirectional way with some people decreasing their food intake during or after stress; whereas others increase their food intake during stress (Adam & Epel, 2007). Individuals who eat in response to stress prefer high fat and/or sweet foods, therefore over time, stress-induced eating can contribute to obesity (Kandiah, Yake, Jones, & Meyer, 2006; Kim et al., 2009). Although the literature has not established one primary pattern of stress-induced overeating, researchers have narrowed the focus to two specific types: restrained and emotional eating. The literature describing both of these eating styles is described below.

*Restrained eating style.* Restraint theory proposes that individuals differ on a spectrum of dietary concern and self-awareness about their body image and weight (Rutledge & Linden, 1998). Restrained eating refers to a persistent pattern of eating-related cognitions and behaviors in order to reduce or maintain body weight (Herman & Mack, 1975). As such, restrained eaters are those who intentionally restrict their diet by consuming only a narrow range of food choices and a limited amount of calories (Rutledge & Linden, 1998). This line of research was initiated by Herman and colleagues (Herman & Mack, 1975; Herman & Polivy, 1975), who theorized that eating patterns are influenced by the balance between physiological factors prompting the desire for food and the psychological efforts to resist that desire. This cognitively mediated effort to combat the urge to eat is termed restraint. People vary in the extent to which they exercise restraint (Ruderman, 1986). At one end of the continuum are the restrained eaters who constantly worry about what they eat and struggle to resist certain

types of food. At the other end are unrestrained eaters who eat freely as the desire strikes them (Ruderman, 1986).

Herman and Polivy (1980) later suggested that the self-control of restrained eaters may be temporarily disrupted by certain disinhibiting events or stressors, which, in turn increases their physiological need for food. This ultimately results in the consumption of large quantities of food, which leads most restrained eaters to frequently experience weight fluctuations (Ruderman, 1986). This process of cognitive disinhibition typically includes thoughts such as “I’ve blown it, the day is lost – I might as well continue to eat.” Polivy and Herman (1983) argue that strong stressors temporarily overwhelm restrained eaters, thereby decreasing their motivation to diet and possibly causing them to abandon their diet altogether.

In addition to developing their theory of restrained eating, Herman and Polivy (1980) also developed a scale to assess individual differences in restraint. This measure has been used in a number of studies to assess how stress differentially affects food consumption of restrained and unrestrained eaters in a controlled laboratory setting (Boon, Stroebe, Schut, & Jansen, 1997, 1998; Heatherton, Herman, & Polivy, 1991; Polivy & Herman, 1976; Ruderman, 1986). These studies provide empirical support for the hypothesis that stress and strong emotions can lead to an increase of food intake among restrained eaters, but a decrease in food intake among unrestrained eaters.

In their seminal research, Herman and Mack (1975) investigated restrained and unrestrained eating (under the guise of a taste-test) in a sample of 45 college-aged women. Specifically, participants went through a two-phase laboratory experiment

where they were required to first consume 0, 1, or 2 seven and a half ounce milkshakes, then “taste” 3 different flavors of ice cream afterwards indicating their top preference. Those participants high in restraint were predicted to eat greater amounts of ice cream after a large preload (i.e., the milkshakes) than after a small preload or none at all. The less restrained women were hypothesized to behave in the exact opposite manner. Although the main effects for restraint and preload were not significant, the interaction between the two was significant. Specifically, high restraint participants consumed more ice cream after the milkshake preload than after no preload; whereas the women low in restraint consumed decreasing amounts of ice cream as a function of the amount of the preload. This study established that the eating behaviors of normal weight individuals do not always significantly differ from those of obese individuals. When restrained eaters are forced to abandon their restraint, it can result in overeating regardless of whether they are obese or normal weight.

Herman next became interested in other factors that could lead people to abandon their restraint. Herman and Polivy (1975) studied the effects of anxiety and restraint level on 42 obese and normal-weight undergraduate women. Under the guise of being an investigation of the influence on tactile stimulation on taste, participants were told that they would first taste some food, then receive (depending on the group to which they were randomly assigned) a temporary mild or severe shock, and finally taste more food to determine the effects of the “tactile stimulation.” Participants completed a restraint scale after they tasted the food. Although neither anxiety nor restraint alone affected food consumption, analyses indicated that those unrestrained participants randomly assigned to the low anxiety condition ate significantly more than did their

restrained counterparts (177.73 grams vs. 146.88 grams, respectively). However, the restrained participants randomly assigned to the high anxiety condition ate significantly more than did the unrestrained participants randomly assigned to the same condition (respectively, 175.86 vs. 107.6 grams of food). Not only did these results confirm Herman and Polivy's predictions, but they also set the stage for researchers interested in the effects of negative external motivations (i.e., anxiety, stress) on eating behaviors.

Schotte, Cools, and McNally (1990) studied restraint using a different external motivator in their investigation of the effects of film-induced negative affect on overeating in restrained eaters. Sixty women in their late 20s were randomly assigned to watch either a neutral or a negative 20-minute movie segment. Participants randomly assigned to the neutral condition watched scenes from a travelogue; whereas participants randomly assigned to the negative condition watched scenes from a horror film. This procedure was different from past studies investigating stress and laboratory eating behaviors as the use of films allowed the researchers to examine food intake during exposure to a stressful event, rather than in anticipation or following exposure to a stressful event. However, similar to past studies, participants were separated into restrained and unrestrained eating groups based on their responses to the Restraint Scale (Herman & Polivy, 1980), which was administered immediately after they watched the film segments. There was a significant interaction between film condition and restraint. Restrained eaters who watched to the horror film ate more than did restrained eaters who viewed to the neutral film, as well as unrestrained eaters who watched either of the films. Participants shown the horror film reported higher levels of anxiety, depression, anger, and tension, in addition to lower levels of relaxation and happiness

than did those shown the neutral film. These findings lend support to the argument that negative affect can contribute to overeating in restrained individuals.

Cools, Schotte, and McNally (1992) expanded on Schotte et al. (1990) by including a third comedic film condition to test the effects of positive affect on food intake. In this study, Cools et al. (1992) used a sample of 91 female community college students to investigate if the effects of positive emotional arousal on overeating amongst restrained eaters would be similar to those of negative emotional arousal. They found a significant interaction between induced mood and restraint, such that there was significantly greater food intake among high-restraint than among low-restraint participants in the comedy and horror film conditions, but not in the neutral film condition. Food intake among low-restraint eaters did not differ significantly across film categories. There were also main effects of film condition suggesting that negative mood states more strongly motivate restraint abandon than do positive mood states. It should also be noted that although the original restraint theory predicts that unrestrained eaters will eat less when under stress, the findings from this study are not unusual as other studies have found there to be no difference in food consumption between emotionally aroused unrestrained eaters and non-emotionally aroused unrestrained eaters as well (for a review, see Macht, 2008 and Oliver, Wardle, & Gibson, 2000).

Rutledge and Linden (1998) expanded this line of research by investigating the affective and physiological mechanisms of stress-eating in 77 undergraduate women. Caucasian and Asian participants completed three phases for this study: an initial baseline phase during which resting blood pressure and heart rate readings were recorded, a stress-induction phase in which they completed three brief cognitive tasks,

and a recovery period during which several snack foods were available to them as they completed a brief questionnaire. Blood pressure and heart rate readings were also monitored throughout to provide a physiological indicator of stress in addition to the self-reported measures. As in other studies, the dietary restraint measure was not administered until the completion of the recovery period, prior to being debriefed. Restrained participants who reported high levels of negative affect in reaction to the cognitive tasks ate nearly twice as much food as those similar in restraint but with lower levels of negative affect. The unrestrained participants showed exactly the opposite pattern with higher levels of negative affect predicting reduced food consumption.

*Emotional eating style.* There is overlap between the concepts of restrained and emotional eating, although the research literatures are distinct. Emotional eating theory argues that some people eat in order to cope with stress, and therefore, are at heightened risk of becoming obese (Macht, 2008). Following traditional psychodynamic thinking, emotional eating theory suggests negative emotions as eliciting stimuli, eating as operant behavior, and the eating-induced reduction of negative emotions, as negative reinforcement (Macht, 2008). Put simply, this theory proposes that emotional eating is initiated to cope with negative emotions, with the eating acting as a reward, thereby promoting this behavior to continue.

A high proportion of the meals and snacks emotional eaters consume are presumably ingested based on the motivation to eat in order to cope with negative emotions (Macht, 2008). Consequently, emotional eaters tend to consume sweet, high-fat foods in response to stressful situations to regulate their emotions, as these types of food have been suggested to reduce stress. Although restrained eaters have been

found to increase food intake in response to both negative and positive emotions and also to cognitive demand, emotional eaters have been shown to increase eating only in response to negative emotions (Macht, 2008).

In an investigation of emotional eating theory, Oliver and colleagues (2000) experimentally investigated the effects of acute stress on food choice and eating attitudes (i.e., restrained and emotional eating) during a meal. In their sample of 68 adult women ( $n = 41$ ) and men ( $n = 27$ ) of normal weight, participants receiving the stressor were told that they would have to prepare and videotape a 4-minute speech after eating a midday meal, while participants in the control group listened to a passage of neutral text before eating the meal. After 10 minutes' exposure to either the stressful or control condition, participants were provided a buffet-style lunch where they were able to choose from a variety of high and low fat bland (i.e., steamed rice, boiled eggs), salty (i.e., smoked salmon, bacon), and sweet (i.e., meringue, milk chocolate) foods. Blood pressure, heart rate, mood, and hunger were also measured throughout the experiment. Eating attitudes were measured via the Restraint, Emotional, and External Eating scales of the Dutch Eating Behaviors Questionnaire (DEBQ; van Strien, Frijters, Bergers, & Defares, 1986). Results indicated no significant effects of stress on overall food intake. Results also suggested that dietary restraint had no significant effects on appetite. Stressed emotional eaters ate meals higher in fat, sugar, and more energy-dense than did unstressed and non-emotional eaters. These findings confirm theories that emotional eaters eat more sweet, high-fat foods in response to stressful situations to regulate their emotions, which could also predispose them to becoming obese (Macht, 2008).



Moon and Berenbaum (2009) conducted two studies to investigate whether emotional awareness was associated with emotional eating. Emotional awareness was described by these authors as the extent to which one attends to and values one's emotions as well as the extent to which one can identify and describe one's own emotions. Guiding both experiments was the hypothesis that lower levels of attention to emotion would be associated with increased levels of emotional eating. In Study 1, 198 female undergraduates completed questionnaire packets comprised of items on emotional awareness and emotional eating. Results indicated that emotional awareness was a significant predictor of emotional eating.

In Study 2, Moon and Berenbaum intended to validate the findings of Study 1 using a laboratory study. Specifically, the researchers induced stress in 100 young adult women, different from those sampled in Study 1, then monitored how much food participants ate in response to their stress. Stress was induced by informing participants that they would be meeting a male research participant and that they would be evaluating each other. As they waited for the male participant to enter the room, the women were given two surveys to fill out; one to be completed after they had formed their first impression of the male participant, and another on mood. During this time, they were also allowed to eat the available snack foods which consisted of chocolate chip cookies and potato chips. After waiting 10 minutes, the participants were informed that because the male participant had yet to show up for the session, the researchers were not going to be able to run the experiment as expected. They were then asked to complete a scale on their emotional awareness. Participants who reported more emotion in expectation of the interaction consumed more calories than did those who

exhibited less emotionality. Although emotional eating was measured using methods different from those of Oliver et al. (2000), this research still suggests that individuals who eat to cope with the emotionality involved in stressful situations are at risk for becoming obese.

Although past research has shown strong parallels between emotional eating and restrained eating, there is still a lack of literature that has investigated emotional eating in a laboratory setting. Thus, restrained eating will be the primary focus of the current study. Secondary hypotheses are presented below to explore the effects of stress eating, given its potential relevance.

### **The Present Study**

This study links two independent lines of research. Survey research demonstrates that for many African Americans racial discrimination is a stressor that has negative effects on their health behaviors and health outcomes. Laboratory studies demonstrate that acute stress produces binge eating among individuals who typically try to restrain their eating. These two disparate research traditions suggest that one contributor to obesity among African American women might be overeating in response to stress induced by racial discrimination.

As explained in previous sections, African American women face a unique combination of ethnicity-related inequalities including poverty, low socioeconomic status, low educational attainment, internalized racism, high psychological stress, and reduced access to health care (Blanchard, 2009; Campo & Mastin, 2007). Researchers in this field have called for research that examines how African American women's responses to stress contribute to their high rates of obesity. Therefore, the primary

purpose of the current study was to elucidate the relationship between stress and eating behaviors among African American women. Although all forms of stress were expected to disinhibit eating among restrained eaters, the stress associated with being the victim of a racial microaggression was expected to induce particularly strong negative emotions in African American women, thereby, enhancing this disinhibition effect among restrained eaters.

In this two part study, African American college women completed a survey which included measures of restrained and emotional eating in Part 1. In Part 2, a subset of the women who completed Part 1 participated in a laboratory study. The laboratory portion of this study used a 2 (Eating Style: Restrained vs. Unrestrained Eating) x 2 (Ostracism: Inclusion vs. Exclusion) x 2 (Reference Group: Outgroup vs. Ingroup) design. Inclusion/exclusion and outgroup/ingroup conditions were randomly assigned during the experimental sessions.

This study extends past research in several important directions. As noted, the focus on African American women's eating habits and racial discrimination-related stress is unique to this study. Another important contribution is measuring participants' restraint style prior to conducting the laboratory study. In past research, this measure has been administered after participants are exposed to the stressor, eat, and complete questionnaires (see Ruderman, 1986 for overview). This methodology creates several problems with interpreting the findings. By measuring restraint after participants have eaten, their responses may reflect how much they ate during the session (e.g., I just 3 bowls of ice cream, therefore I must eat a lot when I'm stressed), rather than their

general preexisting eating style. Measuring restraint prior to the laboratory study reduces demand characteristics and establishes temporal precedence.

As noted earlier, there is stronger evidence for the effects of restrained eating style than emotional eating style on binge eating. However, the emotional eating literature is limited because it does not typically include a measure of usual emotional eating style, despite the availability of reliable instruments such as the emotional eating subscale of the DEBQ and the Emotional Eating Scale (Arnou, Kenardy, & Agras, 1995; van Strien et al., 1986), instead only assessing it based on eating behavior in the study. Thus, a secondary goal of this study is to examine the effects of emotional eating, which was also measured prior to the laboratory study as a part of the initial screening survey.

Also unique to this study is the use of social ostracism as an in-lab manipulation of a racial microaggression. As mentioned above, the social ostracism literature and the racial discrimination literature have mostly developed independently from each other. This study will follow the lead of recent research (i.e., Goodwin et al., 2010; Oberleitner, Hayman, Tkatch, & Abbey, unpublished manuscript; Wirth & K. D. Williams, 2009) and attempt to further integrate the microaggression literature with these two research fields as well.

## **Hypotheses**

### *Primary Hypotheses*

Although the primary focus of this study was on the laboratory experiment, the survey was designed to allow several hypotheses to be tested regarding the relationships between racial discrimination-related stress and eating behaviors in daily life. As previously mentioned, racial discrimination and the stress associated with these

experiences have been suggested as possible contributing factors to the disparate rates of obesity in African American women (Blanchard, 2009). **Hypothesis 1:** It was hypothesized that participants' body-mass index (BMI) would be significantly positively correlated with their reports of racial discrimination and the stress that results from these experiences. The higher participants' BMI, the greater their experience with racial discrimination and the higher their stress.

**Hypothesis 2:** Participants' restraint will be significantly positively correlated with diet status and significantly negatively correlated with how pleased they are with their weight. The greater participants' use of restraint eating, the more likely they are to be on a diet and the less pleased they will be with their current weight.

**Hypothesis 3:** There will be a significantly positive correlation between emotional eating and restraint. The more participants report that they eat in response to feeling certain negative (i.e., distress, sadness, boredom, etc.) emotions, the more they will report that they try to restrain their eating.

**Hypothesis 4:** Main effects of ostracism condition were expected on all of the outcome measures: positive and negative affect; post-game measures of distress, frustration, and pleasantness; how upsetting and enjoyable participants rated the game; and K. D. Williams' (2001) measures of belonging, self-esteem, control, and meaningful existence. In each case, participants randomly assigned to either of the inclusion conditions were expected to have higher scores than excluded participants on positively valenced variables and lower scores than excluded participants on negatively valenced variables.

**Hypothesis 5:** An interaction between ostracism condition and reference group was expected for the amount of food eaten, the psychological variables, and mood.

Specifically, participants ostracized by the outgroup were expected to eat more, score higher on the more negatively valenced psychological variables, and report a worse mood than everyone else.

**Hypothesis 6:** As depicted in Table 1.1, a three-way interaction between restraint, ostracism condition, and reference group on the amount of food eaten was hypothesized. As established above, the effects of ostracism should influence restrained eating and will be exacerbated by the reference group of the computer controlled players. Thus, it was hypothesized that 1) regardless of their reference group, participants low in restraint who were excluded and those high in restraint and were included would eat the least; 2) regardless of their reference group, participants low in restraint who were included would eat significantly more food than those in the aforementioned groups; 3) participants high in restraint who were excluded by their ingroup would eat significantly more food than those in the aforementioned groups; and 4) participants high in restraint who were excluded by their outgroup would eat significantly more food than those in each of the aforementioned groups.

Table 1.1

*Hypothesized Three-way Interaction of Restraint, Ostracism Condition, and Reference Group on the Amount of Food Eaten*

	Low Restraint		High Restraint	
	<i>Included</i>	<i>Excluded</i>	<i>Included</i>	<i>Excluded</i>
<b>Ingroup</b>	b	a	a	c
<b>Outgroup</b>	b	a	a	d

Note: Participants in cells with different letters were expected to have significantly different scores. Participants in cells with letters that appear earlier in the alphabet were hypothesized to eat less than participants in cells with higher letters (e.g., a less than b less than c, etc.)

### *Secondary Hypotheses*

**Hypothesis 7:** Emotional eating was expected to be positively correlated with restrained eating. Consequently, Hypotheses 2, 4, and 6 were expected to apply to emotional eating as well, such that:

- a) Participants' diet status will be significantly negatively correlated with how pleased they are with their weight, and significantly positively correlated with their level of emotional eating.
- b) In the emotional eating model, main effects of ostracism are expected on the same variables as in the restrained eating model.
- c) As illustrated in Table 1.2, a three-way interaction between emotional eating, ostracism condition, and reference grouping on the amount of food eaten was

also hypothesized. Specifically, it was hypothesized that 1) regardless of their reference group, included low and high emotional eaters would eat the least; 2) regardless of their reference group, low emotional eaters who were excluded would eat significantly more food than those in the aforementioned groups; 3) high emotional eaters who were excluded by their ingroup would eat significantly more food than those in the aforementioned groups; and 4) high emotional eaters who were excluded by their outgroup would eat significantly more food than those in each of the aforementioned groups.

Table 1.2

*Hypothesized Three-way Interaction of Emotional Eating, Ostracism Condition, and Reference Group on the Amount of Food Eaten*

	Low Emotional Eater		High Emotional Eater	
	<i>Included</i>	<i>Excluded</i>	<i>Included</i>	<i>Excluded</i>
<b>Ingroup</b>	a	b	a	c
<b>Outgroup</b>	a	b	a	d

Note: Participants in cells with different letters were expected to have significantly different scores. Participants in cells with letters that appear earlier in the alphabet were hypothesized to eat less than participants in cells with higher letters (e.g., a less than b less than c, etc.)



## CHAPTER 2 – Method

### Participants

A convenience sample of 319 self-identified African American/Black women undergraduates participated in Study 1 (the online portion). After carefully screening the data (see Results section for explanation and description), 268 participants qualified for Study 2. Each of these individuals was sent an email invitation to participate in Study 2. Of the 268 that were invited, 124 (46%) participated in Study 2.

### Procedures

All of the procedures for Studies 1 and 2 were approved by Wayne State University's Human Investigation Committee.

*Study 1 (Online Portion).* Participants were recruited to participate in Study 1 in two ways. First, the study was listed on the Department of Psychology's research participation (SONA) website as a study of "College Students' Eating Habits." Only women self-identified as being African American were eligible to participate in this study. Eligible women who were interested in completing this survey clicked on the study title and were taken to a page displaying the information sheet for the study. Because the questionnaire materials associated with Study 1 were administered online, the information sheet served as an informed consent form. Those individuals wishing to proceed on to the questionnaire materials clicked "YES, Start Survey" to indicate their consent to participate in Study 1.

In order to increase the number of potential participants, an advertisement was placed on Wayne State University's campus-wide student and employee information website (Pipeline). Interested individuals were instructed to email the Principal

Investigator for more information on the study. The Principal Investigator then emailed the eligible individuals detailed instructions on how to register on SONA and complete Study 1.

Each participant completed the measures described below, as well as a few other measures that are not relevant to the purposes of this dissertation. Participants were also screened for food allergies and other health issues (i.e., pregnancy, hypertension, and diabetes) that might have influenced their in-lab food consumption. On average, participants took approximately 36 minutes to complete the online questionnaire. Upon completion, participants were compensated one-half hour of research/extra credit for the psychology course of their choice. Those women who were invited to participate in Study 1 from Pipeline were entered into a drawing to win one of three Best Buy gift cards or a Nintendo Wii Fit Plus home entertainment system. Two weeks after the conclusion of the data collection, the drawing was held and the winning participants came back to the laboratory to receive their prizes.

*Study 2 (Laboratory Portion).* As stated above, women who completed Study 1 and who did not have any health conditions that would make it unwise for them to eat large quantities of snack food were invited to participate in Study 2 via email. Specifically, participants were not eligible for Study 2 if they had food allergies, were pregnant, had ever had a blood pressure reading with systolic greater than 140 or diastolic greater than 90, or if they had diabetes. Eligible, interested participants scheduled a session, and then received an email from the Principal Investigator instructing them not to eat for 4 hours before their appointment. They were told that the lab session focused on social behavior, concentration, and hunger, and that eating too

close to when they were scheduled to participate in the study might alter their performance. Although this exact cover story had not been used in past research, stories similar to this one have been successfully used in the past (i.e., Boon et al., 1997, 1998; Boon, Stroebe, Schut, & Ijntema, 2002). Before their session, participants were randomly assigned to one of the four ostracism conditions: ingroup inclusion (participants were included in the ball passing game and saw African American faces), outgroup inclusion (participants were included and saw Caucasian faces), ingroup exclusion (participants were excluded and saw African American faces), or outgroup exclusion (participants were excluded and saw Caucasian faces).

Participants were guided through the entire lab portion of the study by an African American woman experimenter in order to prevent ethnicity and gender confounds. The experimenters used scripts to help guide the participants through the study and to ensure all participants were treated similarly. A copy of the script used can be found in Appendix Q (pp. 112-128). Upon arrival, informed consent was obtained. Afterwards, to initiate the cover story, the experimenter explained to each participant that prior to her arrival, the Principal Investigator randomly assigned her to either eat or not eat during the study and was then handed a sealed envelope which would indicate if she was going to be able to eat during the study. The envelope contained a sheet of paper that simply said, "You will eat." Next, participants completed a pregame questionnaire packet containing items to obtain information on the last time they had anything to eat as well as their current levels of hunger, positive and negative affect, distress, frustration, and pleasantness to obtain a baseline assessment of their affective state, as

is standard in eating studies in which a change in affect is expected (i.e., Harris, Bargh, & Brownell, 2009; Herman & Mack, 1975; Weighill & Buglass, 1984).

After obtaining informed consent and pregame measures, participants were then escorted to a room where they were seated at a desk in front of a computer monitor and mouse – the keyboard had been locked in the desk drawer to deter them from attempting to surf the Internet during the experiment. The experimenter then informed participants that for the social interaction, they would play a game called “Cyberball” so their social behaviors could be observed. Specifically, participants were informed that the researchers were interested in how their current level of hunger would effect how they would interact with other people and that one of the best ways to do this would be to have them play an on-line ball tossing game (Cyberball) with other participants who were logged onto the game website at the same time. These “other participants” were actually computer generated and operated via specific programming.

The participants were further instructed that in this game, they would play toss with 3 participants from other Michigan universities by clicking on the picture of the player to whom they wanted the ball to go, and then waiting until it was thrown back to them. Standard to studies using Cyberball (for a review, see K. D. Williams, 2009), participants were instructed to mentally visualize the entire game as if it were taking place in real life to further entice their interest in the game. To help them create in their minds a complete mental picture of what might be happening if they were playing the game in real life, it was also suggested that the participants consider the following: use the pictures to help imagine what the other players actually looked like and what sort of people they were, consider what the other participants were thinking while they played

the game, where the other participants were from, and where they all would be playing if the game was actually taking place in person.

As a part of the cover story, participants were told that in order to set up the game, the experimenter used some basic information (i.e., eye color, skin color, hair color, basic hair length, whether or not she wore glasses, etc.) to create a picture that would serve only as a very basic generalization of their appearance – just to give the other players an idea of with whom they were playing the game. Participants were then told that the picture would be automatically erased as soon as the game was over.

Next, participants were shown an example of what the screen was going to look like once connected to the game. The experimenter pointed out to participants that as they played the game, they would only see the pictures of the other participants and not their own picture. Participants were further instructed that their position would be indicated as “Player 4” with a hand at the bottom of the screen. Depictions of what participants saw on-screen can be found in Appendices O & P (pp. 110 & 111). Participants were then told to read a brief description of the game and instructions on how to play it on the computer screen.

After ensuring that participants had not played the game before and reiterating how to pass the ball to the other participants once they received it, the experimenter then gave participants the snacks they would have available to eat during the study. Participants were given two bowls: one with three servings (3.0 ounces) of plain chocolate M&Ms candies and one with one serving (1.5 ounces) of Pringles potato crisps. Participants were also provided a bottle of water to drink.

To further support the cover story, after providing participants with their snacks and water, the experimenter told them that a call would have to be placed to the “data center” to make sure the other participants were ready to begin playing the game. The experimenter then went to a phone located just outside of the participant room (still in participants' hearing range), and staged a brief phone call in order to further support the cover story.

After the phone call, the experimenter entered the participant room and informed participants that the other participants were ready to play. Participants were informed that the game would take anywhere from 5 minutes to 8 minutes, so the experimenter would return in 8 minutes to continue with the rest of the study. Participants were further instructed that if the game ended before the 8 minutes were up, they should use that time to reflect on the people with whom they played the game. Specifically, participants were told to think about how the other participants behaved during the game and possible reasons why they may have behaved as they did, and to also think about their own behavior during the game and the reasons for their actions. In actuality, the game only took 3 minutes from start to finish. The other 5 minutes were added to give participants more time to eat.

After ensuring that participants understood all instructions up to that point, the experimenter left the room for 8 minutes while participants played Cyberball. Participants started out with the ball and had to click on the picture of one of the other 3 players to throw the ball. Participants randomly assigned to the ostracism condition received the ball 3 times early in the game; then they did not receive the ball for the duration of the game, which lasted for 50 throws, or approximately 3 minutes.

Participants randomly assigned to the inclusion condition received the ball 12 times (roughly 25% of the 48 throws went to the participant). Despite having 2 less throws, the inclusion condition still lasted 3 minutes, just as did the ostracism condition. After the game was over, participants were reminded via an on-screen prompt to wait until the experimenter reentered the room for further instructions. After the 8 minutes were over, the experimenter returned and instructed participants to complete a postgame questionnaire packet that included the Cyberball questionnaire, a second affect scale, and a postgame questionnaire (all of which are described in more detail below). The experimenter left the food and water with participants so that they could continue to snack on the foods.

After participants completed the postgame questionnaire packet, they received instructions on how to complete another exercise that was intended to keep their focus away from the actual intentions of the study. Specifically, in efforts to highlight the “concentration” portion of the “Concentration, Social Behavior, and Hunger Study,” participants completed a word fragment completion task which is described in more detail below. Next, the experimenter obtained participants' weight, height, and waist circumference. After obtaining this information, the experimenter asked participants a series of questions to ensure that the deception had worked. After these questions were answered, participants were fully debriefed as to the actual purpose of the lab study, and then asked to sign an agreement indicating that they would not discuss the study with any other Wayne State University students.

Lastly, participants were thanked and compensated for their time. The first 95 participants received 1.5 hours of research credits for the psychology class of their

choice. These individuals participated in Study 2 during the last month and a half of the Winter 2010 term (in other words, during the “regular” school year). The remaining participants (including those recruited from Pipeline), were not enrolled in a psychology course at the time they participated in Study 2 (during the Spring/Summer 2010 term). In order to encourage the participants who completed Study 1 during the Winter term to participate in Study 2 even if they were no longer enrolled in a psychology course, participants were also given the choice of receiving a \$10 gift card to Subway, Bigby Coffee, Starbucks, or Barnes & Noble as compensation. In addition, all of the women who participated in Study 2 during the Spring/Summer 2010 term were entered into a drawing for one of three exercise videos or a Nintendo Wii Fit Plus home entertainment video game system. As mentioned above, the winners for this drawing were selected two weeks after the conclusion of the data collection.

## Measures

All measured described below are included in the Appendices.

### Measures in the Online Study

*Restrained and emotional eating.* The restrained and emotional eating subscales of the Dutch Eating Behavior Questionnaire (DEBQ; van Strien et al., 1986) were used to assess restrained and emotional eating. The restraint subscale is comprised of 10 items that focus on dieting behaviors enacted in efforts to either maintain or lose weight. The emotional eating subscale is comprised of 13 items which focus on the desire to eat while experiencing specific emotions, such as when feeling bored, lonely, or depressed. All items were rated on a 5-point Likert-type scale: never (1), seldom (2), sometimes (3), often (4), and very often (5). High scores on the restraint measure indicate that



participants often try to restrain their food intake. High scores on the emotional eating measure indicate that participants often feel the urge to eat when feeling strong emotions. Measures of internal consistency for both subscales in the current study indicate high reliability with Cronbach alphas of .95. These findings are very similar to those obtained by van Strien and colleagues (1986;  $\alpha = .95$  for restrained eating,  $\alpha = .94$  for emotional eating) in their initial study.

*Demographics.* A demographics questionnaire developed by the author was used to gather background information about participants. Questions assessed the following: age, year in school, employment status, living situation, and parent's education level.

*Health practices.* A few questions about specific health practices relevant to the study's focus were developed by the author. Participants were asked questions about their general snack-food preference, snack food preference when stressed, current diet status, current pleasure with their weight, and whether they smoke.

*Health screening.* Twelve questions were used to determine participants BMI and if they had health concerns that would exclude them from the laboratory study. Specifically, participants were asked to provide their weight and height (to calculate self-reported BMI), when they last had an appointment with the doctor, any food allergies, current medications, and whether they were pregnant. In addition, participants were asked if they ever had a blood pressure reading with a systolic rate greater than 140 or a diastolic rate greater than 90 (indicating high blood pressure), and if they had ever been diagnosed with diabetes.

*Perceived discrimination and discrimination-related stress.* The General Ethnic Discrimination Scale (GEDS; Landrine et al., 2006), an update of the Schedule of Racist Events (SRE; Landrine & Klonoff, 1996), was used to assess both the frequency and the appraisal of reports of discriminatory events. The GEDS consists of 18 items, each completed three times: once for the frequency of the racist event in the past year, once for the frequency of the racist event during one's entire life, and once again for the appraisal of the stressfulness of the racist events (only 17 of the 18 items are completed for appraisal). Each item measuring the frequency of the racist event (both past year and lifetime) was scored with a 6-point scale ranging from 1 (this has never happened to me) to 6 (this happens to me almost all of the time). Those items measuring the stressfulness of the specific racist event were scored from 1 (not at all stressful) to 6 (extremely stressful). Internal consistency for the recent ( $\alpha = .91$ ), lifetime ( $\alpha = .92$ ), and appraised discrimination scales ( $\alpha = .92$ ) was similar to those obtained in previous studies ( $\alpha = .94, .94, \text{ and } .95$ , respectively; Landrine et al., 2006).

*Body shape dysphoria.* The thirty-four-item version of the Body Shape Questionnaire (BSQ-34; Cooper, Taylor, Cooper, & Fairburn, 1987) was used to assess how participants felt about their bodies. Specifically, the BSQ-34 asked respondents to report how they have been feeling about their appearance over the past four weeks. All items were rated on a 6-point Likert-type scale: never (1), rarely (2), sometimes (3), often (4), very often (5), and always (6). Measures of internal consistency indicate high reliability with a Cronbach alpha of .98; findings very similar to those obtained by Cooper and colleagues (1987;  $\alpha = .95$ ) in their initial study.

Measures in the Laboratory Study

*Weight, height, and waist circumference.* Weight was measured, without shoes, using a calibrated digital scale. Height was measured, without shoes, using a wall-mounted stadiometer. Waist circumference was measured using an abdominal circumference tape measure.

*Pre and postgame measures.* A 14-item questionnaire was created for the current study to measure attitude and hunger levels prior to playing the Cyberball game. Specifically, this questionnaire contained an item asking participants to indicate the last time they had anything to eat before their session, an open-ended item asking what they last ate, and items assessing their pre-game levels of hunger, distress, frustration, and pleasantness. The hunger, distress, frustration, and pleasantness items were all scored on a 10-point Likert-type scale where 1 indicated “not at all” and 10 indicated “very”.

Although only one item was used to assess hunger (i.e., on a scale of 1 to 10, please indicate how hungry you are feeling right now), distress, frustration, and pleasantness were all measured via factor-analyzed subscales (refer to Results section for description of these analyses). These scales yielded Cronbach’s alphas of .74, .71, and .73, respectively, indicating good reliability.

Similar to the pregame measure, a 26-item questionnaire was created to assess attitude and hunger levels after playing the Cyberball game. This questionnaire was divided into two sections. The first section contained 11 items that asked participants to indicate how they felt about the Cyberball game. These 11 items were factor analyzed for classification purposes, which resulted in 2 factors representing aggravation and enjoyableness. These scales demonstrated good reliability with Cronbach’s alphas of

.84 and .79, respectively. These items were also scored using a 10-point Likert-type scale identical to that used to assess the pregame items.

The second section contained 15 items designed to measure attitude and hunger levels after playing the Cyberball game. Specifically, this questionnaire used the same adjectives as those used pregame to assess participants' postgame levels of hunger, distress, frustration, and pleasantness. These items were also factor-analyzed to determine the subscales. The postgame measures each demonstrated good reliability with Cronbach's alphas as follows: distress, .85; frustration, .83; and pleasantness, .69.

*Self-reported mood.* Mood was measured using the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS is comprised of ten positive affect and ten negative affect adjectives. Participants rated the extent to which they were currently experiencing each of twenty specific feelings and emotions both before and after playing the Cyberball game. All items were rated using a Likert-type scale ranging from 1 (very slightly or not at all) to 5 (extremely). Separate scores were calculated for positive and negative affect by summing together the appropriate items. This scale has demonstrated good internal consistency reliability in past studies of mood states on eating behaviors (Harris et al., 2009; Wallis & Hetherington, 2004; positive affect  $\alpha = .89$ , negative affect  $\alpha = .85$ ). In the current study, Cronbach's alphas for positive affect were similarly high at .88 pregame and .89 postgame. Alphas for negative affect were somewhat lower at .74 pregame and .68 postgame.

*Effects of Ostracism.* After the Cyberball game, participants completed a 24-item postgame questionnaire that has been used in past Cyberball ostracism research (e.g., Wirth & K. D. Williams, 2009; Zadro et al., 2006). This questionnaire included items

designed to serve as manipulation checks for deception (e.g., “Did the game connect to the server quickly?”) and inclusion/ostracism (e.g., “To what extent were you included by the other participants during the game?”).

This questionnaire also contained 3 items that assessed belonging (e.g., “I felt poorly accepted by the other participants”) which had an alpha of .72. There were also 3 items that assessed control (e.g., “I felt that I was able to throw the ball as often as I wanted during the game”), which yielded a borderline acceptable alpha of .68. Also included were 3 items that assessed self-esteem (e.g., “During the Cyberball game, I felt good about myself”). This subscale yielded an alpha of .76. Three items assessed meaningful existence (e.g., “I felt nonexistent during the Cyberball game”) and produced an alpha of .67. Lastly, 3 adjectives assessed how participants felt during the Cyberball game (e.g., “I felt angry during the Cyberball game”). This subscale yielded an alpha of only .63.

Items were reversed scored, when necessary, and unless otherwise indicated, all items were answered using a 9-point Likert-type scale ranging from 1 (not at all) to 9 (very much so). In general, these measures had lower alphas in this study than reported in past research (Gonsalkorale & K. D. Williams, 2007; Goodwin et al., 2010; Wirth & K. D. Williams, 2009). Specifically, these measures have demonstrated alphas in the following ranges: belonging = .74 – .91; self-esteem = .70 – .85; control = .72 – .85; meaningful existence = .66 – .86; and mood = .82 – .92.

## Chapter 3 - Results

### *Preliminary Analyses*

Prior to analyzing the data to test the hypotheses, the accuracy of both data files (i.e., survey data and lab data) was verified. The procedures used to check the survey data are discussed first, followed by the procedures used to verify the lab data. Frequencies were run on each survey variable to ensure that all responses were transferred accurately from the online database to the data analysis program and to investigate the amount of missing data. Of the 319 individuals who completed Study 1 (the survey portion), 51 (16%) were disqualified from participating in Study 2 (the laboratory portion). Thirteen percent ( $n = 43$ ) were ineligible due to indications of food allergies (i.e., chocolate, peanuts, potatoes, etc.), pregnancy, hypertension, or diabetes. The remaining 3% gave responses that suggested they did not take Study 1 seriously (i.e., taking less than 15 minutes to complete the 218-item questionnaire, exhibiting no variation in item responses, choosing not to answer more than 20% of the items).

The amount of missing data in the remaining participants' surveys was low (less than 2%). Mean-substitution calculations were conducted to replace any missing data within specific variables (Tabachnick & Fidell, 2001). After creating scale scores, another set of frequencies was run to obtain the means and standard deviations of each of the major survey study variables included in the analyses and to check the scales for issues with nonlinearity and heteroscedasticity, and issues with nonnormal variables (i.e., skewness and kurtosis; Tabachnick & Fidell, 2001). Analyses showed normality with all of the survey study scale scores, thereby negating the necessity to transform any of the variables.

The same stringency was enacted while checking the data entered from the lab study as well. However, as these data were entered into the data analysis program by hand, rather than imported from an online database, they were triple-checked to ensure there were not errors in entry. All analyses described below were conducted both with and without missing data replacement via mean substitution (Tabachnick & Fidell, 2001). Comparing the effect sizes of the analyses conducted with mean substitution to those conducted with no mean substitution indicate only small differences, if any, between the two. Therefore, the mean-substituted analyses were used as they allowed for all participants to be included.

Next, scale scores for the lab data were created, followed by running another set of frequencies to obtain the means and standard deviations of each of the major lab study variables included in the analyses and to check the scales for skewness and kurtosis. These analyses also displayed normality with all of the lab study scale scores, therefore no transformations were performed.

### *Sample Demographics*

As displayed in Table 3.1, most participants were between the ages of 18 and 22 ( $M = 24.41$ ,  $SD = 7.92$ ). Just over half of the participants were either sophomores or juniors. More than half of the sample worked either part time or full time. Most of the sample reported both parents having at least a high school diploma or GED. Over half of the participants did not live at home with their parents. Although half of the participants' indicated that they were currently trying to lose weight, less than one-quarter of the sample reported that they were currently on a diet. Participants were evenly divided in their stress eating, with about one-third eating less, one-third eating

more, and one-third eating the same when under stress. Most of the sample reported eating both sweet and salty foods when under stress. Although well over half of the sample had a BMI that classified them as either overweight or obese ( $M = 27.83$ ,  $SD = 6.84$ ), most of the participants reported being happy with their current weight, which was supported by over half of the sample reporting a low level of body shape dysphoria. The majority of the sample had experienced some type of racial discrimination in their lifetime, especially in the past year. Over half of the sample reported mid levels of both restrained ( $M = 22.64$ ,  $SD = 9.79$ ) and emotional eating ( $M = 31.06$ ,  $SD = 11.72$ ).

Table 3.1

*Demographic Information of Study Participants in Survey and Laboratory Sessions (N = 124)*

Variable	Value	f	%
Age	18 – 22	73	58.9
	23 – 27	21	16.9
	28 – 32	12	9.7
	33+	18	14.5
Year in School	Freshman	22	17.7
	Sophomore	34	27.4
	Junior	34	27.4
	Senior	28	22.6
	Other	6	4.8
Employment Status	Not Working	55	44.4
	Part Time	54	43.5
	Full Time	15	12.1
Mother's Education	Didn't Complete High School	13	10.5
	High School Graduate (or GED)	28	22.6
	College Graduate	24	19.4
	Post-Baccalaureate Degree	14	11.3



Father's Education	Didn't Complete High School	20	16.1
	High School Graduate (or GED)	40	32.3
	College Graduate	12	9.7
	Post-Baccalaureate Degree	4	3.2
Living Situation	Alone	29	23.4
	With Roommates	38	30.6
	With Parents	51	41.1
Trying to Lose Weight?	Yes	63	50.8
	No	61	49.2
Stress Eating	Less	40	32.5
	The Same	44	35.8
	More	39	31.7
Stress Food Preference	Sweet Foods	14	12.0
	Salty Foods	30	25.6
	Both Types of Food	73	62.4
Current Weight Happiness	Happy	74	59.7
	Unhappy	50	40.3
Currently Dieting?	Yes	20	16.1
	No	104	83.9
Body Mass Index	Underweight	6	4.8
	Optimal	47	37.9
	Overweight	24	19.4
	Obese	47	37.9
Lifetime Experiences with Discrimination	None	2	1.6
	Some	111	89.5
	A Lot	11	9.0
Past Year Experiences with Discrimination	None	9	7.3
	Some	114	91.9
	A Lot	1	0.8
Restrained Eating Scale Score	Low	55	44.4
	Medium	63	50.8
	High	6	4.8
Emotional Eating Scale Score	Low	41	33.1
	Medium	77	62.1
	High	6	4.8

Body Shape Dysphoria Scale Score	Low	73	58.9
	Medium	48	38.7
	High	3	2.4
Total Food Eaten in Lab (in ounces)	0.0 – 1.4	44	35.5
	1.5 – 2.9	56	45.2
	3.0 – 4.5	24	19.3
Total M&Ms Eaten in Lab (in ounces)	0.0 – 1.0	72	58.1
	1.1 – 2.0	35	28.2
	2.1 – 3.0	17	13.7
Total Chips Eaten in Lab (in ounces)	0.0 – 0.5	18	14.5
	0.6 – 1.0	31	25.0
	1.1 – 1.5	75	60.5

### *Results from Factor Analyses*

Principal component factor analyses with VARIMAX rotation were performed through the Predictive Analytical Software (PASW, a.k.a., SPSS 18; 2009) to examine the structure of the pre and postgame questionnaire items, the postgame Cyberball-specific questionnaire items, and to investigate the formation of possible subscales. The factor analyses for each of the measures are described below separately.

Prior to conducting the factor analyses, bivariate correlations were run on the items to observe intercorrelations and possible factor structures. As expected, pregame hunger did not yield a strong correlation with any of the other variables. However, pregame agitation was found to have strong correlations with multiple variables, suggesting the possibility of this variable being problematic in the factor analysis as it could have a high loading on more than one factor. Therefore, pregame hunger and agitation were not entered into the factor analysis.

The remaining ten items were factor analyzed, indicating a three-factor structure that accounted for 63.62% of the variance. As displayed in Table 3.2, the first factor,

“Pre-game Distress”, contained four items and accounted for 36.97% of the variance. The second factor, labeled “Pre-Game Frustration” contained three items and accounted for 16.58% of the variance. The last factor was labeled “Pre-Game Pleasantness”, contained three items, and accounted for the remaining 10.07% of the variance. As mentioned above in the measures section, each of the scales yielded relatively high Cronbach’s alphas ( $\alpha > .71$ ), thereby demonstrating each to have good internal consistency.

Table 3.2

*Factor Loadings for Subscale Structure with Varimax Rotation of Pre- and Post-Game Questionnaire Items*

Item	Distress		Frustration		Pleasantness	
	Pre ( $\alpha = .74$ )	Post ( $\alpha = .82$ )	Pre ( $\alpha = .71$ )	Post ( $\alpha = .83$ )	Pre ( $\alpha = .73$ )	Post ( $\alpha = .69$ )
How stressed do you feel right now?	<b>.77</b>	<b>.73</b>	.14	.32	-.22	-.12
How uneasy do you feel right now?	<b>.64</b>	<b>.76</b>	.37	.22	-.12	-.17
How nervous do you feel right now?	<b>.71</b>	<b>.81</b>	-.06	.04	-.05	-.12
How tense do you feel right now?	<b>.73</b>	<b>.79</b>	.04	.23	-.26	-.14
How hopeless do you feel right now?	.08	.17	<b>.81</b>	<b>.84</b>	-.02	-.20
How helpless do you feel right now?	.09	.19	<b>.86</b>	<b>.89</b>	.07	-.17
How angry do you feel right now?	.09	.36	<b>.66</b>	<b>.68</b>	<b>-.45</b>	-.21
How happy do you feel right now?	-.16	-.15	.01	<b>-.40</b>	<b>.81</b>	<b>.70</b>
How calm do you feel right now?	<b>-.58</b>	-.13	-.13	-.12	<b>.53</b>	<b>.63</b>
How pleasant do you feel right now?	-.25	-.14	.08	-.10	<b>.78</b>	<b>.89</b>

Note. Factor loadings greater than .40 are in boldface.

Results suggest pregame calm as a variable of concern as it cross-loads highly on both the pregame distress and pleasantness factors. Correlational analyses indicate

that pregame calm was significantly negatively correlated with pregame distress factor variables stress,  $r(124) = -.54, p < .001$ , and tense,  $r(124) = -.49, p < .001$ , yet significantly positively correlated with the pregame pleasantness factor variable pleasant,  $r(124) = .50, p < .001$ . Although the pregame calm variable proved problematic, the postgame measure was not, as it loaded on the postgame pleasantness factor only. Pregame angry cross-loaded on both the pregame frustration and pregame pleasantness factors as well. Postgame happy also cross-loaded on two factors: postgame frustration and postgame pleasantness. According to Tabachnick and Fidell (2001), the primary purpose of the Varimax rotational technique is to “minimize the complexity of factors by maximizing variance of loadings on each factor” (p. 615). Thus, it is typical practice to remove such variables. However, due to the amount of variance accounted for by the factors as presented, as well as their good internal consistencies, I decided not to drop pregame calm and angry from the factor analyses.

Although there were fifteen post-game items, only the post-game counterparts of the ten items entered into the pre-game analyses were examined in the second factor analysis. Also shown in Table 3.2, this analysis yielded a three-factor structure as well, and accounted for 68.74% of the variance. The first factor, “Post-game Distress”, accounted for 44.56% of the variance. The second and third factors, “Post-Game Frustration” and “Post-Game Pleasantness”, accounted for 13.66% and 10.52% of the variance, respectively. As also indicated above in the measures section, the post-game distress and frustration factors yielded very good Cronbach’s alphas ( $\alpha > .82$ ), while post-game pleasantness yielded a less-reliable alpha of .69.

Next, another bivariate correlation analysis was conducted on the eleven Cyberball-related items from the post-game questionnaire. One item assessing how much the participants felt the Cyberball game made sense was not found to have a strong correlation with any of the other variables and was therefore excluded from the factor analysis. Table 3.3 displays the two-factor structure for the remaining ten variables, which accounted for 59.06% of the variance. The first factor, “Cyberball Enjoyable”, was comprised of six items and accounted for 34.21% of the variance. The second factor, “Cyberball Upsetting”, included four items and accounted for the remaining 24.85% of the variance.

Table 3.3

*Factor Loadings for Subscale Structure with Varimax Rotation of Cyberball-Induced Mood Questionnaire Items*

Item	Cyberball Enjoyable ( $\alpha = .79$ )	Cyberball Upsetting ( $\alpha = .84$ )
How entertaining was the Cyberball game?	<b>.83</b>	.18
How engaging was the Cyberball game?	<b>.80</b>	-.10
How involving was the Cyberball game?	<b>.70</b>	-.27
How boring was the Cyberball game?	<b>-.63</b>	.12
How funny was the Cyberball game?	<b>.62</b>	.16
How pleasant was the Cyberball game?	<b>.61</b>	-.23
How disturbing was the Cyberball game?	-.03	<b>.89</b>
How upsetting was the Cyberball game?	-.19	<b>.85</b>
How sad was the Cyberball game?	-.03	<b>.77</b>
How stressful was the Cyberball game?	-.02	<b>.76</b>

*Note.* Factor loadings greater than .40 are in boldface.

### *Bivariate Correlations Between Survey Measures*

The first set of hypotheses focused on the correlations among the survey measures. These bivariate correlations, as well as the means and standard deviations of the measures, are displayed in Table 3.4. In support of Hypothesis 1, participants' BMI was significantly positively correlated with reports of racial discrimination both over the last year and lifetime. The amount of stress resulting from the discriminatory experiences was also positively significantly correlated with BMI. The more discriminatory experiences participants had in the last year and over their entire life, the higher their BMI. Also the more racism-related stress participants reported, the higher participants' BMI.

In support of Hypothesis 2, restrained eating was significantly negatively correlated with happiness with current weight and significantly positively correlated with diet status. The greater participants' restraint regarding what they eat because of concerns about their weight, the more unhappy they were with their current weight and the more likely they were to be on a diet. In support of Hypothesis 3, restraint scores were significantly positively correlated with participants' emotional eating scores. The greater participants' restraint, the greater their desire to eat when feeling emotional.

Table 3.4

*Summary of the Bivariate Correlations, Means, and Standard Deviations for Survey Measures*

Measure	1	2	3	4	5	6	7	8	9
1 Body Mass Index (BMI)	1.00								
2 Recent Racism	.18*	1.00							
3 Lifetime Racism	.23**	.82**	1.00						
4 Racism-Related Stress	.35**	.63**	.73**	1.00					
5 Happiness with Weight	-.52**	-.17†	-.25**	-.40**	1.00				
6 Currently Dieting	.32**	.03	.06	.18*	-.48**	1.00			
7 Restrained Eating	.51**	.18*	.24**	.36**	-.43**	.45**	1.00		
8 Emotional Eating	.25**	.24**	.28**	.32**	-.46**	.35**	.36**	1.00	
9 Body Shape Dysphoria	.60**	.31**	.28**	.50**	-.66**	.50**	.67**	.41**	1.00
<b>Mean</b>	27.83	28.39	33.29	37.27	2.69	1.16	22.67	31.02	75.62
<b>Standard Deviation</b>	6.84	10.22	11.74	16.24	1.04	.37	9.95	11.76	35.31

Note: \*\* $p < 0.01$ , \* $p < 0.05$ , and † $p < 0.10$ .

*ANOVAs and MANCOVAs to Evaluate Laboratory Study Hypotheses<sup>1</sup>*

To verify that random assignment was effective, a series of two-way analyses of variance (ANOVAs) were conducted to see if there were any pretest differences between groups. Specifically, nine different 2 (ostracism condition: included vs. excluded) x 2 (reference group: ingroup vs. outgroup) ANOVAs were conducted with the following variables specified as dependent variables: recent racist events, lifetime racist

<sup>1</sup> Regression analyses were also conducted and the results were comparable to those reported in the text.

events, racism-related stress, body shape dysphoria, and pre-game negative affect, positive affect, distress, frustration, and pleasantness. There was a significant main effect of reference group on recent racist events and body shape dysphoria, [ $F(1, 120) = 4.19, p < .05$  and  $F(1, 120) = 6.31, p < .05$ ; respectively]. Participants randomly assigned to play the game with ingroup members reported having had fewer racist experiences in the past year and feeling less dysphoric about their body shape than did participants randomly assigned to play the game with outgroup members. Therefore, these two survey variables were treated as covariates in the multivariate analysis of covariance (MANCOVA) to account for the variance that these variables may contribute to any significant results from this analysis. Although, none of the pre-game laboratory measures differed between groups at the pretest, these were also included as covariates so as to adjust for any pre-game differences in mood.

A bivariate split of participants' restrained eating scores was used to create high and low restraint groups. Next, a 2 (High Restraint vs. Low Restraint) x 2 (Included vs. Excluded) x 2 (Ingroup vs. Outgroup) MANCOVA was conducted, with recent racist experiences, body shape dysphoria, and pre-game negative affect, positive affect, distress, frustration, and pleasantness as covariates.<sup>2</sup> The dependent variables were: total amount of food consumed; post-game positive affect, negative affect, distress, frustration, and pleasantness; ratings of how much the game upset them and how enjoyable it was; and scores on K. D. Williams' et. al's (2000) measures of belonging, control, self-esteem, and meaningful existence. As can be seen in Table 3.5, there were significant effects associated with six of the seven covariates, the main effects of

<sup>2</sup> Supplementary analyses were conducted with and without covariates. Analyses run without covariates did not yield  $F$  values significantly different from those run with covariates.



ostracism and restrained eating, and the interaction between ostracism and reference group.

Table 3.5

*Multivariate Tests using Wilks' Lambda on Laboratory Study Measures for Restraint*

Effect	Value	F	Hyp. df	Error df	Sig.	Partial Eta Sq.
Intercept	.52	7.20	12.00	94.00	.000	.48
<i>Covariates</i>						
PANAS Pre-Game Positive Affect	.46	9.31	12.00	94.00	.000	.54
PANAS Pre-Game Negative Affect	.79	2.14	12.00	94.00	.021	.22
Pre-Game Distress	.70	3.41	12.00	94.00	.000	.30
Pre-Game Frustration	.75	2.66	12.00	94.00	.004	.25
Pre-Game Pleasant	.77	2.32	12.00	94.00	.012	.23
Recent Discrimination	.93	.57	12.00	94.00	<i>ns</i>	.07
Body Shape Dysphoria	.70	3.42	12.00	94.00	.001	.30
<i>Independent Variables</i>						
Ostracism Condition	.36	13.98	12.00	94.00	.000	.64
Reference Group	.92	.64	12.00	94.00	<i>ns</i>	.08
Restrained Eating	.79	2.10	12.00	94.00	.024	.21
<i>Interactions</i>						
Ostracism x Reference Group	.81	1.86	12.00	94.00	.049	.19
Ostracism x Restrained Eating	.91	.78	12.00	94.00	<i>ns</i>	.09
Reference Group x Restrained Eating	.83	1.62	12.00	94.00	<i>ns</i>	.17
Ostracism x Reference Group x Restrained Eating	.95	.39	12.00	94.00	<i>ns</i>	.05

Table 3.5 displays the main effects from the MANCOVA for the following covariates: pre-game positive affect, negative affect, pre-game distress, frustration, and pleasantness, and body shape dysphoria. As to be expected, pre-game positive affect had a significant main effect on post-game positive affect. Pre-game negative affect had significant main effects on post-game negative affect and post-game frustration, and marginal main effects on post-game positive affect and the K. D. Williams' et al.'s (2000) Cyberball self-esteem construct. Pre-game distress had significant main effects on post-game distress, how upsetting participants found Cyberball, and the K. D. Williams' et al.'s (2000) Cyberball control construct. Pre-game frustration had significant main effects on post-game frustration and on the K. D. Williams' et al.'s (2000) Cyberball belongingness and control constructs. Pre-game pleasantness had a significant main effect on post-game distress and pleasantness, how upsetting participants found Cyberball, and on the K. D. Williams' et al.'s (2000) Cyberball self-esteem construct. Body shape dysphoria had a significant main effect on both post-game positive affect and distress.

Main effects of ostracism were hypothesized and there was a significant main effect of ostracism condition in the MANCOVA. Table 3.6 displays results from the follow up univariate *F* tests. There were significant effects for 10 of the 12 dependent measures including participants' post-game positive and negative affect; post-game distress, frustration, and pleasantness; how upsetting and enjoyable participants found the Cyberball game; and their feelings of belongingness, control, self-esteem, and meaningful existence while playing Cyberball. Participants who were included reported significantly more positive affect and significantly less negative affect after playing the

Cyberball game than did those who were excluded. Included participants reported feeling significantly less distressed and frustrated, and significantly more pleasant than those who were excluded. Participants that were included found the Cyberball game significantly less upsetting and significantly more enjoyable than did those who were excluded. Included participants reported significantly higher feelings of belongingness, control, self-esteem, and meaningful existence while playing Cyberball than did those who were excluded. These results provide full support to Hypothesis 4.

Table 3.6

*Univariate Main Effects of Ostracism on Dependent Variables in Restrained Eating Model*

Effect	Included	Excluded	F (1, 105)	Sig.	Partial Eta Squared
	M (SD)	M (SD)			
Total Food Eaten	2.00 (1.14)	2.15 (1.07)	.33	ns	.00
Post-Game Positive Affect	32.62 (7.56)	28.18 (8.39)	12.24	.001	.10
Post-Game Negative Affect	12.08 (3.28)	13.10 (3.25)	4.54	.035	.04
Post-Game Distress	9.40 (7.54)	11.29 (7.29)	1.88	ns	.02
Post-Game Frustration	4.45 (3.29)	7.43 (5.89)	11.64	.001	.10
Post-Game Pleasantness	23.42 (4.90)	20.14 (5.73)	10.15	.002	.09
Cyberball Upsetting	6.13 (4.02)	11.65 (8.28)	21.19	.000	.17
Cyberball Enjoyable	32.03 (10.94)	23.77 (10.28)	17.86	.000	.15
Belongingness	22.63 (4.52)	12.30 (4.88)	136.06	.000	.56
Control	18.37 (4.90)	10.56 (5.46)	70.26	.000	.40
Self-Esteem	14.72 (6.76)	7.55 (4.38)	46.22	.000	.31
Meaningful Existence	20.25 (5.81)	10.82 (4.86)	83.18	.000	.44

Main effects of restraint were not hypothesized; however, the univariate main effects were examined because the multivariate main effect of restraint was significant. Table 3.7 displays results from univariate  $F$  tests. There were marginal or significant effects for 2 of the 12 dependent measures. There was a significant effect of restraint on post-game positive affect, such that participants low in restraint reported significantly more positive affect after Cyberball than did those high in restraint. There was also a marginally significant effect of restraint on the amount of food eaten, such that participants who were low in restraint ate more than did those who were high in restraint.

Interactions between ostracism and reference group were hypothesized and this interaction was significant in the MANCOVA. Thus, follow-up ANOVAs were computed. In partial support of Hypothesis 5, this interaction was significant for one dependent measure. The univariate  $F$  test indicated a significant interaction of ostracism and reference group on post-game distress ( $F(1, 105) = 6.63, p = .011$ ). Simple effects analyses were conducted to examine the interaction. As displayed in Figure 3.1, independent groups  $t$  tests indicated participants who were included by the ingroup were significantly less distressed after playing Cyberball than were those who were excluded by the ingroup,  $t(46.60) = -32.73, p = .002$ . In contrast, there were no significant differences between participants who were included by the outgroup and those excluded by the outgroup in reports of post-game distress,  $t(48.25) = .95, p = ns$ . Contrary to hypothesis, the interaction between ostracism and reference group was not significant for food consumption or any other psychological or mood variables.

Table 3.7

*Univariate Main Effects of Restraint on Dependent Variables in Restrained Eating Model*

Effect	Low	High	<i>F</i> (1, 105)	Sig.	Partial Eta Squared
	Restraint	Restraint			
	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )			
Total Food Eaten	2.29 (1.16)	1.87 (1.02)	3.50	.064	.03
Post-Game Positive Affect	30.61 (8.51)	30.20 (8.08)	6.76	.011	.06
Post-Game Negative Affect	12.37 (3.30)	12.80 (3.31)	.03	<i>ns</i>	.00
Post-Game Distress	9.05 (6.57)	11.61 (8.06)	.34	<i>ns</i>	.00
Post-Game Frustration	5.25 (4.06)	6.61 (5.69)	2.59	<i>ns</i>	.02
Post-Game Pleasantness	22.08 (5.48)	21.49 (5.65)	.09	<i>ns</i>	.00
Cyberball Upsetting	7.97 (6.09)	9.79 (7.81)	.85	<i>ns</i>	.01
Cyberball Enjoyable	28.51 (11.23)	27.31 (11.54)	1.28	<i>ns</i>	.01
Belonging	17.08 (6.86)	17.84 (7.15)	.07	<i>ns</i>	.00
Control	14.64 (5.82)	14.30 (7.12)	2.29	<i>ns</i>	.02
Self-Esteem	11.46 (6.71)	10.81 (6.77)	.00	<i>ns</i>	.00
Meaningful Existence	15.66 (7.18)	15.41 (7.15)	.68	<i>ns</i>	.01

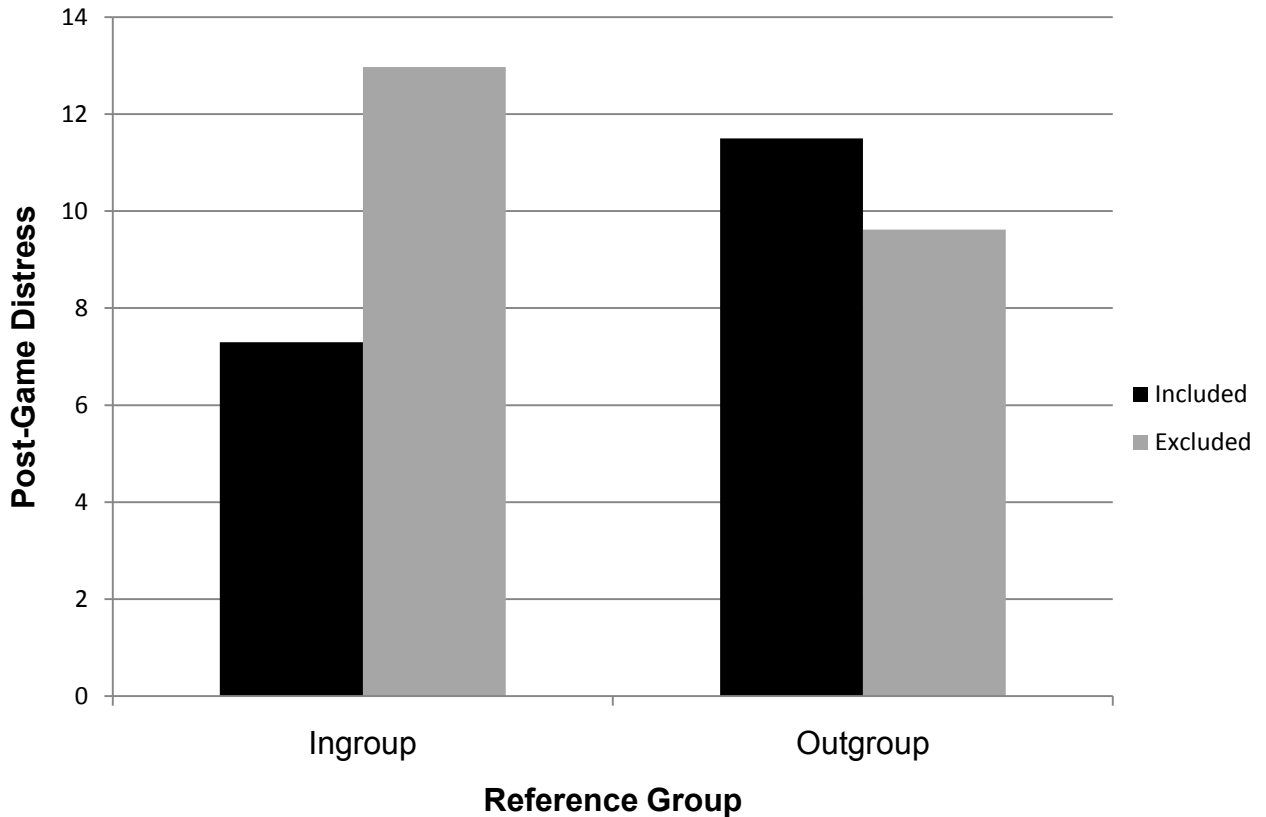


Figure 3.1. The Effects of Ostracism and Reference Group on Post-Game Distress

As shown in Table 3.5, the three-way interaction between restraint, ostracism condition, and reference group was not significant in the MANOVA. Thus, follow-up ANOVAs were not run and the sixth hypothesis was not supported.

#### *Analyses to Investigate Hypotheses on Emotional Eating*

As hypothesized, restrained eating was significantly positively correlated with emotional eating. Therefore, the same data trends observed with restrained eating were expected to arise with emotional eating. A bivariate split of participants' emotional eating scores was computed to create high and low values of responses. Next, a 2 (High Emotional Eating vs. Low Emotional Eating) x 2 (Included vs. Excluded) x 2 (Ingroup vs.

Outgroup) MANCOVA was conducted, with pre-game negative and positive affect, distress, frustration, and pleasantness, recent racist experiences, and body shape dysphoria again as covariates. The dependent variables were: total amount of food eaten, post-game positive and negative affect, post-game distress, frustration, and pleasantness, how upsetting and enjoyable participants found Cyberball, and scores on K. D. Williams' four fundamental needs (i.e., belonging, control, self-esteem, and meaningful existence).

Table 3.8 displays the main effects from the MANCOVA for the following covariates: pre-game positive and negative affect, pre-game distress, frustration, and pleasantness, and body shape dysphoria. Pre-game positive affect had a significant main effect on post-game positive affect. Pre-game negative affect had significant main effects on post-game negative affect and the K. D. Williams Cyberball self-esteem construct, and a marginal main effect on post-game distress. Pre-game distress had significant main effects on post-game distress and on how upsetting participants found Cyberball, and on the K. D. Williams Cyberball control construct. Pre-game frustration had significant main effects on post-game frustration, and on the K. D. Williams Cyberball constructs of belonging and control. Pre-game pleasantness had significant main effects on post-game distress and pleasantness, how upsetting participants found Cyberball, and on the K. D. Williams Cyberball self-esteem construct. Body shape dysphoria had significant main effects on post-game positive affect and distress.

Main effects of ostracism were hypothesized and there was a significant main effect of ostracism condition in the MANCOVA. Table 3.9 displays results from the follow up univariate *F* tests. Significant effects were found for the following: participants'

post-game positive and negative affect; post-game distress, frustration, and pleasantness; how upsetting and enjoyable participants found the Cyberball game; and their feelings of belongingness, control, self-esteem, and meaningful existence while playing Cyberball. Participants who were included reported significantly more positive affect and significantly less negative affect after playing the Cyberball game than did those who were excluded. Included participants reported feeling significantly less distressed and frustrated, and significantly more pleasant than those who were excluded. Participants who were included found the Cyberball game significantly less upsetting and significantly more enjoyable than did those who were excluded. Included participants reported significantly higher feelings of belongingness, control, self-esteem, and meaningful existence while playing Cyberball than did those who were excluded.



Table 3.8

*Multivariate Tests using Wilks' Lambda on Laboratory Study Measures for Emotional Eating*

Effect	Value	F	Hyp. df	Error df	Sig.	Partial Eta Sq.
Intercept	.52	7.33	12.00	94.00	.000	.48
<i>Covariates</i>						
PANAS Pre-Game Positive Affect	.48	8.50	12.00	94.00	.000	.52
PANAS Pre-Game Negative Affect	.78	2.16	12.00	94.00	.020	.22
Pre-Game Distress	.45	3.51	12.00	94.00	.000	.31
Pre-Game Frustration	.77	2.32	12.00	94.00	.012	.23
Pre-Game Pleasant	.76	2.48	12.00	94.00	.007	.24
Recent Discrimination	.94	.52	12.00	94.00	<i>ns</i>	.06
Body Shape Dysphoria	.74	2.83	12.00	94.00	.002	.27
<i>Independent Variables</i>						
Ostracism Condition	.36	13.77	12.00	94.00	.000	.64
Reference Group	.92	.69	12.00	94.00	<i>ns</i>	.08
Emotional Eating	.86	1.32	12.00	94.00	<i>ns</i>	.14
<i>Interactions</i>						
Ostracism x Reference Group	.83	1.62	12.00	94.00	<i>ns</i>	.17
Ostracism x Emotional Eating	.92	.69	12.00	94.00	<i>ns</i>	.08
Reference Group x Emotional Eating	.93	.59	12.00	94.00	<i>ns</i>	.07
Ostracism x Reference Group x Emotional Eating	.89	.94	12.00	94.00	<i>ns</i>	.11

Table 3.9

*Univariate Main Effects of Ostracism on Dependent Variables in Emotional Eating Model*

Effect	Included	Excluded	F (1, 105)	Sig.	Partial Eta Squared
	M (SD)	M (SD)			
Total Food Eaten	2.00 (1.14)	2.15 (1.07)	.27	<i>ns</i>	.00
Post-Game Positive Affect	32.62 (7.56)	28.18 (8.39)	11.41	.001	.10
Post-Game Negative Affect	12.08 (3.28)	13.10 (3.25)	4.62	.034	.04
Post-Game Distress	9.40 (7.54)	11.29 (7.29)	1.67	<i>ns</i>	.02
Post-Game Frustration	4.45 (3.29)	7.43 (5.89)	11.36	.001	.10
Post-Game Pleasantness	23.42 (4.90)	20.14 (5.73)	10.20	.002	.09
Cyberball Upsetting	6.13 (4.02)	11.65 (8.28)	20.56	.000	.16
Cyberball Enjoyable	32.03 (10.94)	23.77 (10.28)	17.12	.000	.14
Belonging	22.63 (4.52)	12.30 (4.88)	136.09	.000	.56
Control	18.37 (4.90)	10.56 (5.46)	65.08	.000	.38
Self-Esteem	14.72 (6.76)	7.55 (4.38)	43.92	.000	.30
Meaningful Existence	20.25 (5.81)	10.82 (4.86)	80.73	.000	.44

## Chapter 4 - Discussion

The purpose of this dissertation was to investigate the relationship between perceived racial discrimination and the eating behaviors of African American women. This study was based on the assumption that experiencing a racial microaggression by being socially ostracized would produce strong negative emotions, thereby causing a change in normal eating behaviors. Although being ostracized had numerous detrimental effects on psychological well-being, it did not influence the amount of food participants ate in the laboratory.

Previous research suggests that racist experiences and the associated stress contribute to the disparate occurrences of obesity in African American women (Blanchard, 2009). As hypothesized, the current study found that participants' BMIs were significantly correlated with both their recent and lifetime reports of racial discrimination, as well as the stress that results from those experiences. In support of previous research, these results imply that participants with higher BMIs also frequently experience racial discrimination and find these experiences very stressful. Participants' BMI was also significantly correlated with weight happiness, diet status, restrained and emotional eating, and body shape dysphoria, such that as participants' BMIs went up: 1) how happy they were with their weight went down, 2) they were more likely on a diet, 3) they had higher scores on the restrained and emotional eating scales, and 4) they were more unhappy with their body shape.

Support for the second hypothesis was also obtained in that restraint was associated with a greater likelihood of participants being on a diet and more unhappiness with their weight. As restrained eating can be conceptualized as "an eating

pattern in which individuals intentionally engage in certain dietary restrictions in order to maintain or lose weight” (Rutledge & Linden, 1998, p. 222), these results are largely representative of what the literature suggests to be typical of restrained eaters.

As hypothesized, there was a significant positive correlation between restrained eating and emotional eating. As mentioned in Chapter 1, restrained eaters tend to overeat in response to particularly strong stressors that serve as cognitive disinhibitors to their restraint. Similarly, emotional eaters tend to overeat in response to being emotionally aroused or stressed. These findings correspond to those of past studies which suggest that these two constructs overlap.

In support of the fourth hypothesis, main effects of ostracism were found for most of the dependent variables. Included participants reported less negative affect and more positive affect after playing Cyberball than did those who were excluded. Included participants also found the game less upsetting and more enjoyable than did those who were excluded. Included participants further reported that they felt less frustrated and more pleasant than those who were excluded; and participants who were included reported higher feelings of belongingness, control, self-esteem, and meaningful existence while playing Cyberball than did those who were excluded. Post-game distress was the only variable for which ostracism condition did not have a main effect, although the means were in the expected direction. Therefore, it can be stated with confidence that the main effects of ostracism were as hypothesized.

Contrary to expectation, there was a main effect of restraint on post-game positive affect, such that participants who were low in restraint reported significantly more positive affect after playing the game than did those who were high in restraint.

There was also a marginal main effect of restraint on amount of food eaten. Participants who were low in restraint, who don't tend to restrain their food consumption due to concerns about their weight, ate more than participants who were high in restraint, who do tend to restrain their food consumption due to concerns about weight except under times of stress. This finding, as it is counterintuitive, was unexpected and should therefore be replicated before interpretations are made.

Participants excluded by their ingroup felt more distress after playing Cyberball than did participants in any of the other groups. Although an interaction was expected between these two variables, I had expected exclusion from the outgroup to cause the most distress. I had also expected it to affect more outcomes, including food consumption. In retrospect, these findings can be explained by past research which suggests that participants might have been expecting to experience some sort of maltreatment from the Caucasian players (Mendoza-Denton, Downey, Purdie, Davis, & Pietrzak, 2002; Shelton, Richeson, Salvatore, 2005; Swim, Hyers, Cohen, Fitzgerald, Bylsma, 2003). This sample of African American participants might have found it easier to explain their ostracism as being due to racial discrimination than other factors (cf. Goodwin et al. (2010). Thus, participants might have been particularly shocked when they were excluded by the other African American “participants” as there were no obvious differences between them. Future research is needed to explore this counterintuitive finding.

No support was found for the hypothesized 3-way interaction between restraint, ostracism condition, and reference group on the amount of food eaten. Although results suggest eating trends similar to those hypothesized, the lack of significant findings limits

my ability to make any conclusive interpretations. As such, further research is needed to investigate the proposed interaction.

As mentioned above, participants high in restraint were also high in emotional eating. It was, therefore, hypothesized that the analyses based on emotional eating would yield data trends similar to those revealed in the restrained eating analyses. As expected, the findings from the emotional eating analyses were similar to those from the restrained eating analyses, suggesting that these two constructs have similar effects.

### *Study Limitations*

This study had several limitations that may have limited the overall effectiveness and generalizability of the findings. First, using Cyberball as an experimental manipulation of a racial microaggression used to exhibit feelings of racial discrimination in the lab may not have been strong enough to elicit the emotions associated with racially discriminatory experiences. Studies have shown that it is usually a compilation of various microaggressions which tend to catalyze strong negative reactions in victims. Hypotheses for this study were reliant on the idea that most African Americans experience a plethora of racial microaggressions everyday (i.e., Solórzano et al., 2000), therefore exacerbating the stressfulness of the experimental manipulation of this type of racial discrimination. This does not seem to be the case in the current study. However, participants were never asked to assess and report how stressful they found the Cyberball game to be, as in previous studies of racial microaggression (e.g., Solórzano et al., 2000; Sue et al., 2007, 2008), nor were they asked the degree to which they attributed how they were treated while playing Cyberball to racism.

Although studies have suggested it somewhat leading to ask participants to select a cause from a list of potential reasons for why they were treated as they were (for a review, see D. R. Williams, Neighbors, & Jackson, 2003), this information could have been useful in 1) helping determine the effectiveness of the microaggression; 2) providing important insight as to why participants behaved as they did in the laboratory; and 3) helping to explain perhaps the amount of distress participants reported after being excluded by members of their ingroup. Thus, future studies intent on studying the effects of racial microaggressions using Cyberball should include multiple racially discriminatory incidents, rather than just one. In addition, these studies should also be sure to assess participants' perceptions of stressfulness of the game, as well as the causal attributions for how they were treated during the game.

This study was also limited by the types and amount of food provided to the participants. Past studies investigating participants' in laboratory eating behaviors have used milkshakes (Herman & Mack, 1975), ice cream (Herman & Polivy, 1975), cookies (Heatherton, Striepe, & Wittenberg, 1998), and other snack foods (i.e., pop corn, Schotte et al., 1990). Studies by Grunberg and Straub (1992) and Oliver and colleagues (2000) have even provided participants with an assortment of bland, salty, and sweet foods. In addition, many of the above-referenced studies afforded participants at least 10-15 minutes to consume from an unlimited supply of food. However, this study used foods (e.g., M & Ms and potato chips) indicated in piloting to be among the top snack foods choices for the population sampled. In addition, this study was designed on a budget that limited the amount of food participants were given to only 4.5 ounces. It may have proven advantageous to provide participants with a larger quantity of food, and

more food choices as the limited range in food consumption may have reduced the study's power to detect any effects. Thus, future studies of this nature should provide follow past studies on eating behavior and allow participants to eat for no less than 10 minutes from an unlimited supply of food.

An additional limitation to this study is that no physiological measures of stress were taken. Assessing blood pressure, heart rate, skin conductance, and cortisol may have supplemented participants' self-reports of distress to provide insight into how racial microaggressions might influence well-being. Although the self-report data suggests that the stress-inducing procedures were not strong-enough to elicit desired results, further information as to how stressed the participants were by the game could have been provided by the physiological measures.

This study was also limited in that the duration of the laboratory portion of the study may not have been long enough to truly investigate eating as a coping mechanism after being ostracized. Thus, only the reflexive, immediate responses to ostracism were observed, with no attention paid to reflective, coping-related responses. It is possible that participants were not provided enough time to "digest" what happened in the study, reflect on why it happened, and then cope with what happened by eating.

Also limiting this study were the high cross-loadings of pregame calm and angry, and postgame happy on two factors. The primary concern, however, could fall on pregame calm only, as this variable was the only one with a higher loading on a factor different from the one on which it was placed. As mentioned above, placing pregame calm on the pregame pleasantness factor, rather than removing it altogether, yielded a factor structure that accounted for the most variance. As analyses conducted with the



pregame pleasantness factor both with and without pregame calm did not yield different results, and because the postgame calm variable did not indicate any other problems, the factor structure was left intact.

Lastly, this study was limited in that it only focused on a college sample of African American women. Extending this study into the surrounding, urban community may have provided results closer to what was hypothesized. Also incorporating Hispanic/Latina women into the sample may provide useful contributions to the literature as well, as this group is the next most overweight/obese group in the United States.

#### *Implications for Future Theory and Research*

Despite its limitations, this study makes a unique contribution to the social-health psychology literature in that it is one of the first to integrate the restrained and emotional eating literature, the racial microaggression literature, and the social ostracism literature to study the psycho-social influences of obesity in African American women. Although many of the hypotheses were not supported, this study may provide procedural precedence for future restrained or emotional eating, racial microaggressions, or social ostracism studies.

Slight procedural alterations could increase the utility of this paradigm. Specifically, another two-part study could be conducted in which participants would complete restrained and emotional eating measures prior to coming to the laboratory. However, only participants with restraint scores in the lower and upper quartiles of the sample would be selected for the laboratory portion of the study. In addition, to provide a more robust and effective in-lab experience with racial microaggressions, researchers could incorporate multiple microaggressive instances throughout the project. Rather

than using African American women as experimenters, Caucasian women, using scripts replete with microaggressive themes (for a review, see Sue, et al., 2008), could be the experimenters. Upon arriving in the laboratory for Study 2, baseline physiological measures (i.e., blood pressure, cortisol swab, etc.) could be obtained. Study 2 would also follow a random assignment design in that participants would be randomly assigned to one of three conditions: control – included in Cyberball, treated neutrally by the experimenter; mild exclusion – included in Cyberball, treated microaggressively by experimenter; or full exclusion – excluded in Cyberball, treated microaggressively by experimenter. Immediately after playing Cyberball, another physiological reading would be taken and participants would complete the ostracism questionnaire to provide reflexive responses. Next, participants would receive additional instructions from the experimenter to complete a series of other tasks, primarily designed to allow them time to reflect on the game. Afterwards, another physiological reading would be taken, and participants would complete another ostracism questionnaire to determine their reflective responses to their ostracism condition. After providing this information, participants would be allowed 20 minutes to eat from a variety of bland, sweet, and salty foods (i.e., Oliver, et al., 2000). At the end of the study, another physiological reading would be taken and participants would be fully debriefed. These procedures could increase the likelihood of achieving results similar to those hypothesized in the current study and contribute a great amount of information to theories on restrained/emotional eating, racial microaggressions, and social ostracism.

#### *Implications for Treatment and Prevention*

Results from the current study suggest several useful implications for obesity treatment and prevention programs. This research reiterates the importance of educating restrained eaters on how to effectively monitor their stress levels as well as their most prominent sources of emotional arousal so as to help circumvent possible dietary inhibitions. For example, participants' BMIs were significantly positively correlated with restrained and emotional eating. These results suggest that perhaps a cognitive-behavioral approach to treating obesity would work best as the focus would be to help obese individuals focus on their positive efforts to lose weight, rather than ruminating on the factors that have contributed to their obesity (e.g., Freeman, Simon, Beutler, & Arkowitz, 1989).

Perhaps the most significant implications of this study can be towards prevention. In order to most effectively prevent the occurrence of obesity in adulthood, greater attention must be paid to obesity as it occurs in children. For example, despite their level of education and access to health services on campus (i.e., dieting information, free work-out facilities, etc.), over half of the current sample were either overweight or obese. However, most of the women in this sample also reported that they were not currently dieting as they were happy with their weight. As these misconceptions about weight are prevalent amongst African American women (see Blanchard, 2009), greater efforts must be put forth in adolescence to educate this group on the health risks associated with being overweight.

Also, although the current results do not indicate a link between ostracism and eating, they do reiterate the link between ostracism and a reduction in belongingness, control, self-esteem, and meaningful existence; all of which have been linked to

depressive symptoms in adults (for a review, see K. D. Williams, 2007). Research has also established this link in adolescents (i.e., Martyn-Nemeth, Penckofer, Gulanick, Velsor-Friedrich, & Bryant, 2009; Nguyen-Rodriguez, Unger, & Spruit-Metz, 2009). Thus, this study reiterates the importance of including stress-reduction techniques, positive mood promotion, self-esteem building, and positive alternatives to deal with social ostracism in pediatric interventions.

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## APPENDIX A: THE RESTRAINT SCALE

Please answer the following items using the alternatives below the questions.

1. How often are you dieting?  
Never      Rarely      Sometimes      Often      Always
2. What is the maximum amount of weight (in pounds) that you have ever lost in one month?  
0-4      5-9      10-14      15-19      20+
3. What is your maximum weight gain within a week?  
0-1      1.1-2      2.1-3      3.1-5      5.1+
4. In a typical week, how much does your weight fluctuate?  
0-1      1.1-2      2.1-3      3.1-5      5.1+
5. Would a weight fluctuation of 5 pounds affect the way you live your life?  
Not at all      Slightly      Moderately      Very Much
6. Do you eat sensibly in front of others and splurge alone?  
Never      Rarely      Often      Always
7. Do you give too much time and thought to food?  
Never      Rarely      Often      Always
8. Do you have feelings of guilt after overeating?  
Never      Rarely      Often      Always
9. How conscious are you of what you are eating?  
Not at all      Slightly      Moderately      Extremely
10. How many pounds over your desired weight are you at your maximum weight?  
0 – 1      1 – 5      6 – 10      11 – 20      21+

Note:

Participants will not see the names of the scales in the online version of this measure.

While not indicated in the questions above, the online version of this measure will allow the participants to skip any question they are uncomfortable answering.

## APPENDIX B: THE DUTCH EATING BEHAVIOR QUESTIONNAIRE (DEBQ)

**Restrained Eating Items**

1. When you have put on weight, do you eat less than you usually do?\*
2. Do you try to eat less at mealtimes than you would like to eat?
3. How often do you refuse food or drink offered because you are concerned about your weight?
4. Do you watch exactly what you eat?
5. Do you deliberately eat foods that are slimming?
6. When you have eaten too much, do you eat less than usual the following days?\*
7. Do you deliberately eat less in order not to become heavier?
8. How often do you try not to eat between meals because you are watching your weight?
9. How often in the evenings do you try not to eat because you are watching your weight?
10. Do you take into account your weight with what you eat?

**Emotional Eating**

11. Do you have the desire to eat when you are irritated?\*
12. Do you have a desire to eat when you have nothing to do?\*
13. Do you have a desire to eat when you are depressed or discouraged?\*
14. Do you have a desire to eat when you are feeling lonely?\*
15. Do you have a desire to eat when somebody lets you down?\*
16. Do you have a desire to eat when you are cross?\*
17. Do you get the desire to eat when you are expecting something unpleasant to happen?\*
18. Do you get the desire to eat when you are anxious, worried, or tense?\*
19. Do you have a desire to eat when things are going against you or when things have gone wrong?
20. Do you have a desire to eat when you are frightened?\*
21. Do you have a desire to eat when you are disappointed?\*
22. Do you have a desire to eat when you are emotionally upset?\*
23. Do you have a desire to eat when you are bored or restless?\*

**External Eating**

24. If food tastes good to you, do you eat more than usual?
25. If food smells and looks good, do you eat more than usual?
26. If you see or smell something delicious, do you have a desire to eat it?
27. If you have something delicious to eat, do you eat it straight away?

28. If you walk past the bakery do you have the desire to buy something delicious?
29. If you walk past a snackbar or a café, do you have the desire to buy something delicious?
30. If you see others eating, do you also have the desire to eat?
31. Can you resist eating delicious foods? (reverse scored)
32. Do you eat more than usual, when you see others eating?
33. When preparing a meal are you inclined to eat something?

Note:

All items are rated on a 5-point scale: never (1), seldom (2), sometimes (3), often (4), and very often (5). Items marked with "\*" also have a "Non-relevant" answer option.

Bolded items are those to be used in the current study.

Participants will not see the names of the scales in the online version of this measure.

While not indicated in the questions above, the online version of this measure will allow the participants to skip any question they are uncomfortable answering.





8. What is your mother's highest level of education?
- Did not complete high school
  - High school graduate (or GED)
  - Some college
  - College graduate
  - Graduate school degree (M.D., D.D.S., Ph.D., J.D., M.S.W., etc.)
  - Don't know
  - Prefer not to answer
9. What is your father's highest level of education?
- Did not complete high school
  - High school graduate (or GED)
  - Some college
  - College graduate
  - Graduate school degree (M.D., D.D.S., Ph.D., J.D., M.S.W., etc.)
  - Don't know
  - Prefer not to answer
10. What is your current living situation?
- Live with parent(s)
  - Live in a dorm alone
  - Live in a dorm with roommate(s)
  - Live in an apartment alone
  - Live in an apartment with roommate(s)
  - Live in a house alone
  - Live in a house with roommate(s)
  - Prefer not to answer

Note:

Participants will not see the names of the scales in the online version of this measure.

While not indicated in all of the questions above, the online version of this measure will allow the participants to skip any question they are uncomfortable answering.

## APPENDIX D: THE HEALTH PRACTICES QUESTIONNAIRE

Please respond to the items below. If there are any items you wish not to answer, please check "prefer not to answer" or write "n/a" in the space provided.

1. Are you currently trying to lose weight?
  - Yes
  - No
  - Prefer not to answer
  
2. List some of your favorite snack foods: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
  
3. What kinds of feelings, thoughts, or circumstances typically prompt you (or others) to eat or to want to eat (besides simply feeling hungry/being hungry)?  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
  
4. When you have had or are having a bad day, what types of food do you like to eat to help you feel better? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
  
5. When stressed, do you eat:
  - Less
  - The same
  - More
  
6. When stressed, which do you prefer to eat more?
  - Salty foods (i.e., potato chips, pretzels, French fries)
  - Sweet foods (i.e., chocolate, cookies, ice cream)
  - A mix of both
  
7. When thinking of your current weight, are you:
  - Happy
  - Somewhat Happy
  - Somewhat Unhappy
  - Unhappy
  
8. Are you currently on a diet?
  - Yes
  - No
  - Prefer not to answer

9. Do you smoke tobacco?

Yes

No

Prefer not to answer

Note:

Participants will not see the names of the scales in the online version of this measure.

While not indicated in all of the questions above, the online version of this measure will allow the participants to skip any question they are uncomfortable answering.

## APPENDIX E: THE HEALTH SCREENING QUESTIONNAIRE

Please answer the following questions as accurately and as honestly as possible. As a reminder, all answers provided will be kept confidential.

1. What is your weight (in pounds)? \_\_\_\_\_ lbs.
2. What is your height (in feet & inches)? \_\_\_\_\_ feet \_\_\_\_\_ inches
3. When was your last visit to the doctor's office?
 

1	2	3	4	5	6
Less than a	Less than a	Less than	Less than	Over	Can't
Week Ago	Month Ago	Months Ago	a Year Ago	Year Ago	Remember
4. Please list any food allergies you may have \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
5. Please list any medications you are currently taking (include prescriptions, over-the-counter medications, or nutritional supplements or vitamins)  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
6. During the past 12 months have you at any time (during physical activity or while resting) experienced pain, discomfort or pressure in your chest.  
 Yes       No       Don't Know
7. During the past 12 months have you experienced difficulty breathing or shortness of breath, dizziness, fainting, or blackout?  
 Yes       No       Don't Know
8. Do you have a blood pressure with systolic (top #) greater than 140 or diastolic (bottom #) greater than 90?  
 Yes       No       Don't Know
9. Have you ever been diagnosed with diabetes?  
 Yes       No       Don't Know  
 If yes, do you have to take measures to monitor your diabetes (i.e., blood glucose readings, taking insulin shots and/or other medications)?  
 Yes       No       Don't Know

10. Have you ever been diagnosed or treated for any heart disease, heart murmur, chest pain (angina), palpitations (irregular beat), or heart attack?

Yes                       No                       Don't Know

11. Have you ever experienced or been diagnosed with any of the following? (please check all that apply)

- |  |  |
|--|--|
| <input type="checkbox"/> Vision Problems (including needing contacts or eye glasses) | <input type="checkbox"/> Hearing Problems                |
| <input type="checkbox"/> Allergies (drug)  | <input type="checkbox"/> Diabetes                        |
| <input type="checkbox"/> Heart Disease   | <input type="checkbox"/> Kidney or Urinary Problems      |
| <input type="checkbox"/> Dizziness or Fainting Spells                                | <input type="checkbox"/> Asthma or Wheezing Problems     |
| <input type="checkbox"/> Convulsions or Seizures                                     | <input type="checkbox"/> Allergies (food, dust, etc.)    |
| <input type="checkbox"/> Back Problems   | <input type="checkbox"/> Joint Problems                  |
| <input type="checkbox"/> Thyroid Problems  | <input type="checkbox"/> Frequent Headaches or Migraines |
| <input type="checkbox"/> High Blood Pressure   | <input type="checkbox"/> Sleep Disturbances              |

Note:

Participants will not see the names of the scales in the online version of this measure.

While not indicated in the questions above, the online version of this measure will allow the participants to skip any question they are uncomfortable answering.

## APPENDIX F: THE GENERAL ETHNIC DISCRIMINATION (GED) SCALE

We are interested in your experiences with racism. As you answer the questions below, please think about your ENTIRE LIFE, from when you were a child to the present. For each question, please circle the number that best captures the things that have happened to you. Answer each question 3 times; once for what has happened to you IN THE PAST YEAR, once for what has happened to you throughout YOUR ENTIRE LIFE, and once for the stressfulness of the experience. Use these numbers to guide your answers:

Circle 1 = If this has NEVER happened to you

Circle 2 = If this has happened ONCE IN A WHILE (less than 10% of the time)

Circle 3 = If this has happened SOMETIMES (10%-25% of the time)

Circle 4 = If this has happened A LOT (26%-49% of the time)

Circle 5 = If this has happened MOST OF THE TIME (50%-70% of the time)

Circle 6 = If this has happened ALMOST ALL OF THE TIME (more than 70% of the time)

1. How many times have you been treated unfairly by **teachers and professors** because of your race/ethnic group?

How many times in the past year?	1	2	3	4	5	6
How many times in your entire life?	1	2	3	4	5	6
	Not at All				Extremely	
How stressful was this for you?	1	2	3	4	5	6

2. How many times have you been treated unfairly by your **employers, bosses, and supervisors** because of your race/ethnic group?

How many times in the past year?	1	2	3	4	5	6
How many times in your entire life?	1	2	3	4	5	6
	Not at All				Extremely	
How stressful was this for you?	1	2	3	4	5	6

3. How many times have you been treated unfairly by your **coworkers, fellow students, and colleagues** because of your race/ethnic group?

How many times in the past year?	1	2	3	4	5	6
How many times in your entire life?	1	2	3	4	5	6
	Not at All				Extremely	
How stressful was this for you?	1	2	3	4	5	6

4. How many times have you been treated unfairly by **people in service jobs** (by **store clerks, waiters, bartenders, bank tellers, and others**) because of your race/ethnic group?

How many times in the past year?	1	2	3	4	5	6
How many times in your entire life?	1	2	3	4	5	6
	Not at All				Extremely	
How stressful was this for you?	1	2	3	4	5	6

5. How many times have you been treated unfairly by **strangers** because of your race/ethnic group?

How many times in the past year?	1	2	3	4	5	6
How many times in your entire life?	1	2	3	4	5	6
	Not at All				Extremely	
How stressful was this for you?	1	2	3	4	5	6

6. How many times have you been treated unfairly by **people in helping jobs** (by **doctors, nurses, psychiatrists, case workers, dentists, school counselors, therapists, social workers, and others**) because of your race/ethnic group?

How many times in the past year?	1	2	3	4	5	6
How many times in your entire life?	1	2	3	4	5	6
	Not at All				Extremely	
How stressful was this for you?	1	2	3	4	5	6

7. How many times have you been treated unfairly by **neighbors** because of your race/ethnic group?

How many times in the past year?	1	2	3	4	5	6
How many times in your entire life?	1	2	3	4	5	6
	Not at All				Extremely	
How stressful was this for you?	1	2	3	4	5	6

8. How many times have you been treated unfairly by **institutions** (**schools, universities, law firms, the police, the courts, the Department of Social Services, the Unemployment Office and others**) because of your race/ethnic group?

How many times in the past year?	1	2	3	4	5	6
How many times in your entire life?	1	2	3	4	5	6
	Not at All				Extremely	
How stressful was this for you?	1	2	3	4	5	6



9. How many times have you been treated unfairly by **people that you thought were your friends** because of your race/ethnic group?

How many times in the past year?	1	2	3	4	5	6
How many times in your entire life?	1	2	3	4	5	6
	Not at All					Extremely
How stressful was this for you?	1	2	3	4	5	6

10. How many times have you been **accused or suspected of doing something wrong** (such as **stealing, cheating, not doing your share of the work, or breaking the law**) because of your race/ethnic group?

How many times in the past year?	1	2	3	4	5	6
How many times in your entire life?	1	2	3	4	5	6
	Not at All					Extremely
How stressful was this for you?	1	2	3	4	5	6

11. How many times have people **misunderstood your intentions and motives** because of your race/ethnic group?

How many times in the past year?	1	2	3	4	5	6
How many times in your entire life?	1	2	3	4	5	6
	Not at All					Extremely
How stressful was this for you?	1	2	3	4	5	6

12. How many times did **you want to tell someone off for being racist but didn't say anything**?

How many times in the past year?	1	2	3	4	5	6
How many times in your entire life?	1	2	3	4	5	6
	Not at All					Extremely
How stressful was this for you?	1	2	3	4	5	6

13. How many times have you been **really angry about something racist that was done to you**?

How many times in the past year?	1	2	3	4	5	6
How many times in your entire life?	1	2	3	4	5	6
	Not at All					Extremely
How stressful was this for you?	1	2	3	4	5	6

14. How many times were you **forced to take drastic steps** (such as **filing a grievance, filing a lawsuit, quitting your job, moving away, and other actions**) to deal with some racist thing that was done to you?

How many times in the past year?	1	2	3	4	5	6
How many times in your entire life?	1	2	3	4	5	6
	Not at All					Extremely
How stressful was this for you?	1	2	3	4	5	6

15. How many times have you **been called a racist name**?

How many times in the past year?	1	2	3	4	5	6
How many times in your entire life?	1	2	3	4	5	6
	Not at All					Extremely
How stressful was this for you?	1	2	3	4	5	6

16. How many times have you **gotten into an argument or a fight about something racist that was done to you or done to another member of your race/ethnic group**?

How many times in the past year?	1	2	3	4	5	6
How many times in your entire life?	1	2	3	4	5	6
	Not at All					Extremely
How stressful was this for you?	1	2	3	4	5	6

17. How many times have you been **made fun of, picked on, pushed, shoved, hit, or threatened with harm** because of your race/ethnic group?

How many times in the past year?	1	2	3	4	5	6
How many times in your entire life?	1	2	3	4	5	6
	Not at All					Extremely
How stressful was this for you?	1	2	3	4	5	6

18. How **different** would your life be now if you **HAD NOT BEEN** treated in a racist and unfair way...

In the past year?					
Same as it is now	A little different	Different in a few ways	Different in a lot of ways	Different in most ways	Totally different
1	2	3	4	5	6

In your entire life?					
Same as it is now	A little different	Different in a few ways	Different in a lot of ways	Different in most ways	Totally different
1	2	3	4	5	6

## APPENDIX G: THE PRE-GAME QUESTIONNAIRE

Please read each of the following questions carefully and circle your corresponding response.

1. When was the last time you had anything to eat?

Less than 1 hour ago	More than 1 hour but less than 2 hours ago	More than 2 hours but less than 4 hours ago	More than 4 hours but less than 8 hours ago	More than 8 hours ago
-------------------------	---	--	---	--------------------------

2. The last time you had anything to eat, what did you eat? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

For the following items, please circle the corresponding number to indicate how you feel right now.

- |                         |  |               |
|-------------------------|--|---------------|
| 3. not at all stressed  | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very stressed |
| 4. not at all calm      | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very calm     |
| 5. not at all uneasy    | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very uneasy   |
| 6. not at all nervous   | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very nervous  |
| 7. not at all pleasant  | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very pleasant |
| 8. not at all tense     | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very tense    |
| 9. not at all agitated  | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very agitated |
| 10. not at all happy    | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very happy    |
| 11. not at all hopeless | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very hopeless |
| 12. not at all helpless | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very helpless |
| 13. not at all angry    | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very angry    |
| 14. not at all hungry   | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very hungry   |

## APPENDIX H: THE POSITIVE AND NEGATIVE AFFECT SCHEDULE (PANAS)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at the present moment. Use the following scale to record your answers.

1	2	3	4	5
Very Slightly or Not at All	A Little	Moderately	Quite a Bit	Extremely
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	interested		irritable	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	distressed		alert	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	excited		ashamed	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	upset		inspired	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	strong		nervous	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	guilty		determined	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	scared		attentive	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	hostile		jittery	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	enthusiastic		active	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	proud		afraid	

Note:

Participants will not see the names of the scales in the online version of this measure.

While not indicated above, participants will be allowed to skip any question they are uncomfortable answering.

## APPENDIX I: THE CYBERALL QUESTIONNAIRE

**Please respond to the questions below.**

1. Did the game connect to the server quickly?  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
2. Were the pictures in the game clear and recognizable?  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
3. Are you confident in your ability to use a computer?  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
4. Are you confident in your ability to use the internet?  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
5. To what extent were you included by the other participants during the game?  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
6. How bored did this task make you?  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
7. How much would you enjoy playing another game?  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
8. What percent of the throws in the ball tossing game were thrown to you?  
\_\_\_\_\_ %
9. How many times did you catch the ball? \_\_\_\_\_

**Please indicate how much you agree with the following statements.**

1. I felt poorly accepted by the other participants.  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
2. I felt as though I had made a "connection" or bonded with one or more of the participants during the Cyberball game.  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
3. I felt like an outsider during the Cyberball game.  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
4. I felt that I was able to throw the ball as often as I wanted during the game.  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So

5. I felt somewhat frustrated during the Cyberball game.  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
6. I felt in control during the Cyberball game.  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
7. During the Cyberball game, I felt good about myself.  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
8. I felt that the other participants failed to perceive me as a worthy and likeable person.  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
9. I felt somewhat inadequate during the Cyberball game.  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
10. I felt that my performance (e.g., catching the ball, deciding whom to throw the ball to) had some effect on the direction of the game.  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
11. I felt non-existent during the Cyberball game.  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
12. I felt as though my existence was meaningless during the Cyberball game.  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
13. I felt angry during the Cyberball game.  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
14. I enjoyed playing the Cyberball game.  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So
15. My feelings were hurt during the game.  
Not at all    1    2    3    4    5    6    7    8    9    Very Much So

## APPENDIX J: THE POST-GAME QUESTIONNAIRE

The following questions are about the social interaction you just had. Please circle the corresponding number to indicate how you think the Cyberball game ranked on each item.

- |                            |  |                     |
|----------------------------|--|---------------------|
| 1. made no sense           | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | made complete sense |
| 2. not at all engaging     | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very engaging       |
| 3. not at all entertaining | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very entertaining   |
| 4. not at all stressful    | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very stressful      |
| 5. not at all involving    | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very involving      |
| 6. not at all funny        | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very funny          |
| 7. not at all sad          | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very sad            |
| 8. not at all boring       | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very boring         |
| 9. not at all upsetting    | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very upsetting      |
| 10. not at all disturbing  | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very disturbing     |
| 11. not at all pleasant    | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very pleasant       |

Now, for the following items, please circle the corresponding number to indicate how you feel right now.

- |                         |  |               |
|-------------------------|--|---------------|
| 12. not at all stressed | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very stressed |
| 13. not at all rejected | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very rejected |
| 14. not at all calm     | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very calm     |
| 15. not at all uneasy   | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very uneasy   |
| 16. not at all nervous  | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very nervous  |
| 17. not at all pleasant | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very pleasant |
| 18. not at all tense    | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very tense    |
| 19. not at all agitated | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very agitated |
| 20. not at all happy    | 1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10 | very happy    |

21. not at all hopeless      1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10      very hopeless
22. not at all helpless      1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10      very helpless
23. not at all angry      1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10      very angry
24. not at all relaxed      1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10      very relaxed
25. not at all accepted      1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10      very accepted
26. not at all hungry      1 --- 2 --- 3 --- 4 --- 5 --- 6 --- 7 --- 8 --- 9 --- 10      very hungry



## APPENDIX K: THE WORD SOLVING TASK

Below are incomplete words that we would like for you to work on. Please try to fill in the blanks to create a real word in the English language for each item. Please realize that for some, more than one solution is possible, however, we would like you to write the word that comes to mind first.

Examples: C \_ \_ IR → CHAIR or CHOIR

\_ E \_ \_ T → HEART or BEAST

1. \_ \_ A \_ \_

17. D \_ \_ \_ T

2. F \_ \_ \_ \_

18. \_ \_ \_ LY

3. H \_ \_ \_ \_ Y

19. H \_ \_ \_ E

4. C \_ \_ L \_ \_ R

20. \_ \_ \_ \_ VE

5. \_ \_ \_ \_ \_ LTHY

21. B \_ \_ \_ \_ \_ TY

6. G \_ \_ \_ \_ TO

22. \_ \_ \_ \_ \_ TIVE

7. T \_ \_ \_ CK

23. \_ \_ \_ ART

8. ST \_ \_ \_ \_ S

24. \_ \_ \_ MB

9. R \_ \_ CI \_ \_ \_

25. LO \_ \_ \_

10. B \_ \_ \_ CK

26. H \_ \_ \_ GRY

11. LA \_ \_ \_

27. T \_ \_ \_ N

12. SHA \_ \_ \_

28. S \_ \_ IN \_ \_ Y

13. PR \_ \_ \_ \_ Y

29. W \_ \_ \_ GHT

14. WH \_ \_ \_ E

30. PR \_ \_ \_ \_

15. H \_ \_ \_ D

31. W \_ \_ M \_ \_ N

16. CA \_ \_ \_

32. REL \_ \_ \_ \_ \_

APPENDIX L: THE FOOD CONSUMPTION MEASUREMENT & BMI SHEET

Amount of food, in ounces, of each bowl of snack food prior to the participant's consumption (Time 1 Food amount):

Snack Food 1 (M&Ms) 3.0 oz.

Snack Food 2 (chips) 1.5 oz.

Amount of food, in ounces, of each bowl of snack food after the participant's consumption (Time 2 Food amount):

Snack Food 1 (M&Ms) \_\_\_\_\_oz.

Snack Food 2 (chips) \_\_\_\_\_oz

To obtain total amount of food consumed, use the following formula:

Time 1 Food amount (SF 1 amount + SF 2 amount) = 4.5oz.

–

Time 2 Food amount (SF 1 amount \_\_\_\_\_ + SF 2 amount \_\_\_\_\_) = \_\_\_\_\_oz.

---

= Total amount of food consumed \_\_\_\_\_oz.

**Body-Mass Index Information**

Weight = \_\_\_\_\_ lbs.

Height = \_\_\_\_\_ inches

Waist circumference = \_\_\_\_\_ inches

## APPENDIX M: THE DEBRIEFING QUESTIONNAIRE

The researcher(s) asked the participant(s) the following questions before debriefing:

1. ASK: "What did you think was the purpose of this experiment?"

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2. ASK: "Before today, had you seen, heard about, and/or played this game before?"  
(Circle answer)      YES      NO

3. IF YES, ASK: "How do you think having played Cyberball before influenced how you felt about how the game went today?" \_\_\_\_\_

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4. ASK: "Do you think you played the Cyberball game with..." (circle one)

- a)      3 students from another university in Michigan  
b)      3 computer-generated players

5. ASK: "Do you think the sequence of throws by Players 1,2, and 3 were..." (circle one)

- a)      scripted/pre-programmed  
b)      spontaneous

6. ASK: "Besides what may have happened during the game, was there anything that made you uncomfortable in today's session? (Circle answer)      YES      NO

7. IF YES, SAY: "We haven't been doing this study for long, so could you tell me what exactly made uncomfortable in today's session?" \_\_\_\_\_

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## APPENDIX N: THE PARTICIPANT EVALUATION SURVEY

Thank you for participating in our study. We would like your opinion about how the study went for you. This will help us in our future research.

1. To what extent did you understand the instructions given to you by the researchers during the study?

1	2	3	4	5	6	7
Not at all						Very much

2. Do you feel you were treated fairly during the study?

1	2	3	4	5	6	7
Not at all						Very much

3. Do you feel comfortable about everything that happened during the study?

1	2	3	4	5	6	7
Not at all						Very much

4. How would you rate the study on each of the following?

Interesting					Uninteresting
1	2	3	4	5	
Important					Unimportant
1	2	3	4	5	
Confusing					Clear
1	2	3	4	5	
Worthwhile					Not Worthwhile
1	2	3	4	5	
Entertaining					Boring
1	2	3	4	5	
Stressful					Relaxing
1	2	3	4	5	

5. We would like to know how you are feeling right now. To what extent do you feel each of the following?

	Not at all						Very
Angry	1	2	3	4	5	6	7
Distressed	1	2	3	4	5	6	7
Happy	1	2	3	4	5	6	7
Indifferent	1	2	3	4	5	6	7
Pleased	1	2	3	4	5	6	7
Sad	1	2	3	4	5	6	7
Worried	1	2	3	4	5	6	7

6. If you have any comments or concerns about the study, please feel free to describe them here: \_\_\_\_\_

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APPENDIX O: A SCREEN VIEW OF CYBERBALL GAME WITH INGROUP (AFRICAN AMERICAN FACES)



**Participant 2**



**Participant 1**



**Participant 3**



**Participant 4**

APPENDIX P: A SCREEN VIEW OF CYBERBALL GAME WITH OUTGROUP  
(CAUCASIAN FACES)



**Participant 2**



**Participant 1**



**Participant 3**



**Participant 4**

## APPENDIX Q: THE SOCIAL BEHAVIORS, CONCENTRATION, AND HUNGER STUDY SCRIPT

PRIOR TO PARTICIPANT ARRIVAL, RESEARCHER WILL MAKE SURE THAT:

- YOU HAVE A BLANK SHEET OF PAPER TO TAKE NOTES ON PARTICIPANT BEHAVIOR.
- THE COMPUTER IS TURNED ON TO CYBERBALL PROGRAM W/ CONDITION (P.I. will do this)
- THE CONSENT FORMS AND QUESTIONNAIRE PACKET ARE READY
- HEIGHT STATION IS SET UP BEHIND THE DOOR AND THE SCALE IS ON THE BOTTOM SHELF OF THE FOOD CART.
- BE ASSERTIVE, BUT TRY TO REMAIN AS NEUTRAL (NOT TOO NICE, BUT NOT TOO MEAN, JUST RIGHT IN THE MIDDLE) AS POSSIBLE THROUGHOUT THE EXPERIMENT.
- BE UNDERSTANDING AND NON-JUDGMENTAL IN REGARDS TO ANY OF THE PARTICIPANT'S RESPONSES.
- WHEN ASKING QUESTIONS, DO NOT LEAD THE PARTICIPANT (I.E., ASK THEM, "HOW DOES THIS MAKE YOU FEEL?" NOT "DOES THIS UPSET YOU IN ANY WAY?", ETC.)
- REMAIN IN CLOSE PROXIMITY TO THE PARTICIPANT AT ALL TIMES, FREQUENTLY KEEPING AN EYE ON THEM.

WHEN THE PARTICIPANT CALLS THE LAB, THE RESEARCHER SAYS AS FOLLOWS:

Researcher: Social experiences lab, may I help you?

MAKE SURE THAT THE NAME GIVEN MATCHES THAT OF THE WOMAN SCHEDULED FOR THAT SPECIFIC TIMESLOT. RESEARCHER WILL THEN TELL THE PARTICIPANT THE FOLLOWING:

Researcher: Thank you, someone will be down to escort you to the lab shortly.

AFTER HANGING UP, RECHECK TO MAKE SURE THAT THE FORMS ARE ALL READY TO GO AND THAT YOU HAVE 2 PENS (ONE FOR YOU AND ONE FOR THE PARTICIPANT) TO USE DURING THE SESSION.

WHEN YOU GET TO THE END OF THE HALL, OPEN THE DOOR AND CALL OUT THE PARTICIPANT'S NAME. ONCE THE PARTICIPANT ACKNOWLEDGES THAT SHE IS THERE FOR OUR STUDY, SAY THE FOLLOWING:

Researcher: Hello. Please come in and follow me.

TRY TO REMAIN AS NEUTRAL (NOT RUDE, BUT NOT OVERLY FRIENDLY NEITHER) AS YOU CAN IN YOUR GREETING AS WELL AS WHEN WALKING UP WITH THE PARTICIPANT. REMAIN NEUTRAL FOR THE ENTIRE TIME UNTIL



DEBRIEFING OCCURS. WHEN YOU ARRIVE IN THE LAB, DIRECT THE PARTICIPANT TO ROOM **249.4** (THE TV LOUNGE AREA). DIRECT THE PARTICIPANT TO THE TABLE AND SAY:

Researcher: Please have a seat at the table.

AFTER PARTICIPANT HAS A SEAT, SAY THE FOLLOWING:

Researcher: Before we begin with the session, it is important that you not be distracted while participating in the study today. Therefore, we ask that you turn off your cell phone, iPod, or any other device that may go off during the experiment. Please turn off those items now.

**IF PARTICIPANT SAYS THAT SHE WOULD PREFER TO KEEP HER PHONE ON, INSTRUCT HER TO DO THE FOLLOWING:**

*Researcher: If you must keep your phone on, you will have to turn the ringer off. You must turn the ringer all the way off, and not just put it on vibrate, so that you will not be disturbed during the study. Also, absolutely no texting or phone calls are allowed to be accepted or made while the study is being conducted.*

**IF PARTICIPANT SAYS THAT SHE IS EXPECTING AN IMPORTANT PHONE CALL AND NEEDS TO KEEP HER PHONE ON HER, SAY THE FOLLOWING:**

*Researcher: The experiment will last no longer than 1 hour. If you are expecting an important phone call and are unable to fully shut off your cell phone, then we will have to end the session now. You can log back onto the SONA Systems website and reschedule for a later date when you will be able to devote your full attention to the study. We apologize for any inconvenience. I can now escort you back down the hall to the door so that you may exit the building.*

**IF PARTICIPANT EXPRESSES ANY FRUSTRATION OR DISAGREES WITH NOT BEING ABLE TO PARTICIPATE IN THE EXPERIMENT, HANDLE THE SITUATION TO THE BEST OF YOUR ABILITY. HOWEVER, IF NECESSARY, GET THE PRIMARY INVESTIGATOR AND HE WILL FURTHER EXPLAIN TO THE PARTICIPANT WHY SHE CAN NOT PARTICIPATE IN THE EXPERIMENT AT THAT TIME. AFTERWARDS, ESCORT THE PARTICIPANT BACK DOWN THE HALL TO THE DOOR, THANK HER AGAIN FOR HER TIME, AND WISH HER A GOOD DAY.**

WAIT FOR THE PARTICIPANT TO TURN OFF HER CELL PHONE. AFTERWARDS, SAY THE FOLLOWING:

Researcher: Now I need to verify your identity. Please show me your photo ID (i.e., One Card, Driver's License, Passport, etc.)?

**IF THE PARTICIPANT ASKS WHY YOU NEED TO SEE HER ID, SAY THE**

**FOLLOWING:**

*Researcher: Students can only participate in this study once, so we will keep a list of everyone who has participated and we verify names by checking IDs.*

**IF THE PARTICIPANT DOES NOT HAVE A PHOTO ID, THEN THEY CANNOT GO ANY FURTHER IN THE EXPERIMENT. THEREFORE, SAY THE FOLLOWING:**

*Researcher: Because it is important to the experiment that we verify your identity with a photo ID, we cannot allow you to continue until we are able to do so. Therefore, you can log back onto the SONA Systems website and reschedule for a later date when you have your photo ID on you. Is this clear?*

**IF PARTICIPANT EXPRESSES ANY FRUSTRATION OR DISAGREES WITH NOT BEING ABLE TO PARTICIPATE IN THE EXPERIMENT, HANDLE THE SITUATION TO THE BEST OF YOUR ABILITY. HOWEVER, IF NECESSARY, GO GET THE PRIMARY INVESTIGATOR AND HE WILL FURTHER EXPLAIN TO THE PARTICIPANT WHY SHE CAN NOT PARTICIPATE IN THE EXPERIMENT AT THAT TIME.**

*Researcher: If you have no further questions or concerns, today's session is over. I apologize for the inconvenience and look forward to being able to work with you in a future session. Again, we really appreciate your willingness to participate in the experiment today. I hope that you will strongly consider rescheduling for another time when you have your photo ID with you so that we can verify your identity. I can now escort you back down the hall to the door so that you may exit the building.*

**ESCORT THE PARTICIPANT BACK DOWN THE HALL TO THE DOOR, THANK HER AGAIN FOR HER TIME, AND WISH HER A GOOD DAY.**

IF PARTICIPANT HAS ID, CHECK IT TO VERIFY HER IDENTITY. ONCE HER ID HAS BEEN CONFIRMED, CONTINUE WITH THE EXPERIMENT.

Researcher: Thank you. This is a copy of our consent form. This document outlines what you will be doing in the study today. It also addresses the benefits and risks of this study, and how your responses will be kept confidential. Please take a few moments to glance through this document. When you're done, I will highlight a few specifics that you'll need to keep in mind as you participate in the study today. After I've gone through the information on a page with you, I'll need you to initial the bottom of that page in the allotted space. Once we've finished going through the form, then I'll have you sign and date in the appropriate areas as well. As you can see, there are two copies. One will be for you to keep and the other will be for our records. Please take a few moments to look over one of these documents now.

WAIT FOR HER TO FLIP THROUGH THE PAGES. AFTER THE PARTICIPANT LOOKS AS THOUGH SHE'S FINISHED READING THE CONSENT FORM,

VERBALLY POINT OUT THE FOLLOWING INFORMATION, AND, IF YOU'RE ABLE, POINT TO THE PARAGRAPHS ON HER CONSENT FORM WITH YOUR PEN AS YOU EXPLAIN:

Researcher: I would now like to reiterate a few things in this consent form. On page 1, in the first paragraph, it states that this study is about the effects of hunger on social behavior and concentration. In the "study procedures" section of the consent form, it describes that you will first be randomly assigned to either the group that eats or to the group that does not eat during the study. Next it states that you will fill out a few surveys to indicate your current mood and feelings and then engage in a brief social interaction online. If you are assigned to the group that eats, you will be given some snacks to eat and a bottle of water to drink as you interact with the other participants online. If you are assigned to the group that does not eat, you will only be given a bottle of water to drink during the interaction. After the online interaction is over, you will then complete a few more questionnaires. Altogether, this experiment should take about 40 minutes to complete. Do you have any questions about what you are expected to do in this study?

**IF PARTICIPANT ASKS WHAT YOU MEAN BY AN ONLINE SOCIAL INTERACTION, SAY:**

*Researcher: You will be playing a game called Cyberball, which is played basically like you play catch in real life. I will explain more about the game later on. Okay?*

ANSWER ANY QUESTIONS PARTICIPANT MAY HAVE. IF PARTICIPANT ASKS A QUESTION FOR WHICH YOU MAY NOT HAVE AN ANSWER, ASK THE PARTICIPANT TO WAIT A MOMENT WHILE YOU GO CHECK WITH THE PRIMARY INVESTIGATOR. IF PARTICIPANT HAS NO QUESTIONS OR AFTER ALL QUESTIONS HAVE BEEN ANSWERED, CONTINUE WITH:

Researcher: Great, please initial the bottom of this page to indicate we've gone over it. While we don't think it will happen, on page two we have the contact information for Wayne State University's Counseling and Psychological Services, should you experience feelings of sadness or anxiety as a result of the social interaction. I will do my best to make sure you have a comfortable experience in this study. As part of our efforts, I will be reading from this script to help ensure that all participants will be treated the same. Do you have any questions about this aspect of the study?

ANSWER ANY QUESTIONS PARTICIPANT MAY HAVE. IF PARTICIPANT ASKS A QUESTION FOR WHICH YOU MAY NOT HAVE AN ANSWER, ASK THE PARTICIPANT TO WAIT A MOMENT WHILE YOU GO CHECK WITH THE PRIMARY INVESTIGATOR. IF PARTICIPANT HAS NO QUESTIONS OR AFTER ALL QUESTIONS HAVE BEEN ANSWERED, CONTINUE WITH:

Researcher: Further down on page 2, under the compensation section, it states that you have a variety of options to choose from as compensation. Specifically, you can receive

either one and a half hours of research credit for your psychology class, or a \$10 gift card to one of the following places: Subway, Starbucks, Bigby Coffee, or Barnes & Noble. If you choose to receive the credit, it will be granted to you via the SONA systems website once your participation in this study is completed today. In addition, for your participation today, you will also be entered into a drawing to win one of three exercise videos or a Nintendo Wii Fit Plus home entertainment system. Do you have any questions about this aspect of the study? Great. Which method of compensation would you like to receive for your participation today?

MAKE NOTE OF THE TYPE OF COMPENSATION SHE WISHES TO RECEIVE SO THAT YOU CAN TELL THE P.I. WHEN YOU LEAVE TO SET UP TO COMPUTER AND SNACKS. ANSWER ANY QUESTIONS PARTICIPANT MAY HAVE. IF PARTICIPANT ASKS A QUESTION FOR WHICH YOU MAY NOT HAVE AN ANSWER, ASK THE PARTICIPANT TO WAIT A MOMENT WHILE YOU GO CHECK WITH THE PRIMARY INVESTIGATOR. IF PARTICIPANT HAS NO QUESTIONS OR AFTER ALL QUESTIONS HAVE BEEN ANSWERED, CONTINUE WITH:

Researcher: Also on page 2, under the confidentiality section, it states that all information collected about you during the course of this study will be kept confidential. Your answers will be identified in the research records by a number. Information that identifies you personally will not be released. Do you have any questions about this aspect of the study?

ANSWER ANY QUESTIONS PARTICIPANT MAY HAVE. IF PARTICIPANT ASKS A QUESTION FOR WHICH YOU MAY NOT HAVE AN ANSWER, ASK THE PARTICIPANT TO WAIT A MOMENT WHILE YOU GO CHECK WITH THE PRIMARY INVESTIGATOR. IF PARTICIPANT HAS NO QUESTIONS OR AFTER ALL QUESTIONS HAVE BEEN ANSWERED, CONTINUE WITH THE FOLLOWING:

Researcher: Okay, great. Please initial the bottom of this page to indicate we've gone over it. Lastly, on page 3 is the contact information for the Principal Investigator of this project. Should you have any questions after you leave today, please feel free to contact him. Now that I have gone through the consent form with you, do you have any questions about anything stated on this form?

ANSWER ANY QUESTIONS PARTICIPANT MAY HAVE. IF PARTICIPANT ASKS A QUESTION FOR WHICH YOU MAY NOT HAVE AN ANSWER, ASK THE PARTICIPANT TO WAIT A MOMENT WHILE YOU GO CHECK WITH THE PRIMARY INVESTIGATOR. IF PARTICIPANT HAS NO QUESTIONS OR AFTER ALL QUESTIONS HAVE BEEN ANSWERED, CONTINUE WITH:

Researcher: Great. Please make sure that you have initialed the bottom of every page. Now, on page four of both consent forms, there are places for you to sign and date to indicate that you have been informed as to what you are expected to do today as a participant in this study and that you give your consent to participate. Please sign and date each area at this time. Also make sure to put the current time in the appropriate

spot as well.

PARTICIPANT SHOULD NOW SIGN AND DATE THE CORRESPONDING AREAS ON PAGE 4 OF BOTH CONSENT FORMS. BE SURE TO POINT OUT TO HER THAT SHE HAS TO SIGN HER NAME, LEGIBLY WRITE HER NAME, WRITE TODAY'S DATE, AND THE **CURRENT TIME** IN THE APPROPRIATE AREAS. ONCE THE PARTICIPANT HAS DONE THIS, SAY THE FOLLOWING:

Researcher: Thank you, I will now sign and date the appropriate areas to verify that I will keep all information confidential. As I mentioned earlier, I will keep one copy of this document for our records to verify your participation. The other consent form is for your records. You can put your copy of the consent form with your things until the end of the study.

TAKE BACK THE ONE COPY OF THE CONSENT FORM FROM THE PARTICIPANT. AFTER YOU HAVE DONE THIS, TAKE OUT THE "CONDITION ENVELOPE" AND SAY:

Researcher: As I mentioned earlier, as a participant in this study you will be randomly assigned to either the group that eats or to the group that does not eat during the study. Prior to your arrival, the principle investigator assigned you to one of the groups. Inside this envelope is a sheet of paper that indicates whether or not you will eat today. Please open this envelope so that we can find out if you will eat today or not.

HAND THE PARTICIPANT THE ENVELOPE AND HAVE HER OPEN IT. WHEN SHE OPENS IT AND SEES THAT SHE HAS BEEN ASSIGNED TO THE GROUP THAT EATS, SAY:

Researcher: Okay, great. As you can see, you have been assigned to eat during the study today. Because you will be eating, it is important that I ask if you have any allergies to the foods you will be eating. Therefore, do you have any health conditions that might make eating Pringles regular potato chips or plain chocolate M&Ms a problem?

OBTAIN PARTICIPANT RESPONSE.

**IF THE PARTICIPANT ANSWERS YES, THE STUDY WILL HAVE TO BE DISCONTINUED. THEREFORE, THANK THE PARTICIPANT FOR HER TIME AND LET HER KNOW THEY WILL RECEIVE CREDIT FOR THEIR PARTICIPATION BY SAYING THE FOLLOWING:**

*Researcher: Unfortunately, you will not be allowed to participate in the experiment due to health concerns. We thank you for your consideration and apologize for the inconvenience. For your time, you will be compensated one-half hour of research credit. You can now collect your belongings and I will escort you back down the hall.*

**ONCE AT THE END OF THE HALL, THANK THE PARTICIPANT AGAIN FOR HER TIME AND WISH HER A GOOD DAY.**

IF THE PARTICIPANT ANSWERS NO, THEN CONTINUE WITH:

Researcher: Great. This is a copy of our pre-game questionnaire. Please note that it is double-sided and that you need to answer the items on the back of this sheet as well. Please read the instructions to both surveys carefully before you begin. Also, please make sure to answer the items of the scale on the back according to how you are feeling at this moment. If you understand these instructions and have no further questions, I will now leave the room and give you a few minutes to complete these surveys in private. I will be just outside the door, so please let me know when you are finished.

LEAVE THE TV LOUNGE AND PULL THE DOOR SO THAT IT IS ONLY SLIGHTLY AJAR. GO TELL THE P.I. WHAT FORM OF COMPENSATION THE PARTICIPANT WOULD LIKE TO RECEIVE. NEXT, GO TO ROOM 249.3 (THE PARTICIPANT ROOM) TO MAKE SURE THAT THE FOOD CART IS SET UP, CHECKING TO SEE THAT THE CART CONTAINS THE FOLLOWING:

- THE PRE-WEIGHED BOWL OF CHIPS
- THE PRE-WEIGHED BOWL OF M&Ms
- A BOTTLE OF WATER
- NAPKINS
- A ROLL OF PAPER TOWELS

MAKE SURE THAT THE CYBERBALL WELCOME SCREEN IS OPENED (THE P.I. WILL HAVE ALREADY PUT IN THE CONDITION, SO YOU WON'T HAVE TO WORRY ABOUT THAT). YOU SHOULD TAKE ABOUT 5 MINUTES TO DO THIS.

AFTER YOU ARE DONE, PEEK IN THE DOOR (NOTICIABLY) TO SEE IF THE PARTICIPANT IS FINISHED FILLING OUT THE PRE-GAME QUESTIONNAIRES. ONCE YOU SEE THAT SHE LOOKS AS IF SHE'S DONE, REENTERING THE TV LOUNGE AND SAY:

Researcher: Are you finished with the surveys?

TAKE THE SURVEYS FROM THE PARTICIPANT AND CHECK TO SEE THAT SHE HAS COMPLETED BOTH SIDES AND THEN CONTINUE WITH THE FOLLOWING:

Researcher: Okay, great. Now that you're finished with the surveys, you can come with me to begin the social interaction part of this study. Please follow me.

ESCORT PARTICIPANT INTO ROOM 249.3 AND INSTRUCT HER TO HAVE A SEAT AT THE DESK ON THE BACK WALL. MAKE SURE THE PARTICIPANT KEEPS THE DESK CLEAR. IF SHE HAS A PURSE OR OTHER BAGS, TELL HER SHE CAN PUT THEM EITHER ON THE OTHER DESK OR ON ONE OF THE FILING CABINETS. ONCE SEATED, TELL THE PARTICIPANT THE FOLLOWING:

Researcher: As you were completing the surveys, I started setting up the computer for your social interaction. You are going to play a game called Cyberball so that we can observe your social behavior. In this game, you will play toss with 3 other participants. These individuals will be from other Michigan schools as well. In order to set the game up, I used some basic information to create a picture of you so that the other participants will have a general idea of what you look like. I used your eye color, skin color, hair color, basic hair length, whether or not you wear glasses and basic things like that to create this picture. Again, this picture will serve as a very basic generalization of what you look like, just to give the other players an idea of who they are playing the game with. This picture will be automatically erased once the game is over.

**IF SHE ASKS WHAT SCHOOLS THE OTHER PARTICIPANTS ARE FROM, SAY:**

*Researcher: In efforts to keep all data as confidential as possible, we never know which schools the other 3 participants are from. As I stated before, this project is being conducted as part of a larger state-wide study throughout other universities in Michigan. Therefore, all I know is that the other 3 participants will be from schools located in the state of Michigan. Do you have any other questions?*

**TRY TO ANSWER THE PARTICIPANTS QUESTIONS AS BEST YOU CAN AND THEN MOVE ON. IF YOU GET CAUGHT UP ON SOMETHING SPECIFIC, EXCUSE YOURSELF TO GO ASK THE PRINCIPAL INVESTIGATOR FOR HELP TO ANSWER THE QUESTION.**

SHOW THE CYBERBALL GAME EXAMPLE SHEET TO THE PARTICIPANT AND SAY:

Researcher: Alright, so this is an example of what the screen will look like once you connect to the game. As you can see, when you play the game, you will only see the pictures of the other participants; you will not see your own picture. The game was created this way so as to mimic a real game of toss as closely as possible. In other words, you wouldn't really see your own face while you're playing a real game of toss, so this virtual game also takes this into consideration. Therefore, your position will be indicated as participant 4 with this hand at the bottom of the screen. Do you have any questions about this?

ANSWER ANY QUESTIONS AS BEST YOU CAN. IF PARTICIPANT ASKS A QUESTION FOR WHICH YOU DON'T HAVE OR ARE NOT ABLE TO ANSWER, EXCUSE YOURSELF TO GO ASK THE P.I. ONCE YOU'VE ANSWERED ALL THE QUESTIONS, SAY THE FOLLOWING:

Researcher: Great. Now, please take a few minutes to read over the description and game instructions. However, once you have finished reading, please do not click the link to log into the game as I will have more instructions to provide.

ALLOW HER SOME TIME TO READ THROUGH THE ON-SCREEN INSTRUCTIONS. ONCE DONE, SAY:

Researcher: Occasionally, participants have said they have been in studies where they had played this game before. With that in mind, does this game look familiar to you?

OBTAIN ANSWER. IF NO, THEN CONTINUE.

**IF YES, MAKE NOTE OF IT AND SAY THE FOLLOWING TO PROBE FOR MORE INFORMATION (TAKING NOTES OF THE HER ANSWER):**

*Researcher: How does this game look familiar? Have you played it before or previously participated in an experiment that used this game to observe your behavior?*

**MAKE SURE SHE HASN'T PLAYED THE GAME BEFORE OR PARTICIPATED IN RESEARCH THAT USED CYBERBALL. IF SHE SAYS THAT SHE'S EITHER PLAYED THIS GAME BEFORE OR HAS BEEN IN AN EXPERIMENT THAT USED IT, SAY THE FOLLOWING:**

*Researcher: Do you believe your prior experiences with this game will affect how you may behave if you play the game today?*

**WRITE DOWN ANSWER. PROBE HER TO SEE WHAT, IF ANYTHING, SHE SEEMS TO RECALL ABOUT THE GAME BY SAYING THE FOLLOWING:**

*Researcher: Could you please tell me specifically what you remember about it from your previous experiences?*

**WRITE DOWN HER ANSWER. IF SHE SAYS THAT SHE KNOWS IT'S ONLY A PROGRAM BECAUSE OF A PREVIOUS EXPERIENCE, DISCONTINUE THE SESSION. SAY:**

*Researcher: Unfortunately, because your previous experiences with Cyberball may affect your performance in today's session, we cannot continue. You will still be compensated in full for your participation up to this point.*

**SKIP DOWN TO PAGE 14 AND HAVE GO THROUGH THE CONFIDENTIALITY AGREEMENT WITH HER.**

Researcher: Great. Now, to reiterate the instructions, after the ball is thrown to you, simply click on the picture of the person you want to pass the ball to next.

POINT TO THIS ON THE CYBERBALL GAME EXAMPLE SHEET TO MAKE SURE SHE UNDERSTANDS AND SAY:



Researcher: Again, make sure to click on the person's picture, and not the little character that actually throws the ball. Are these instructions clear?

AFTER SHE INDICATES THAT SHE UNDERSTANDS, SAY:

Researcher: Good. I am now going to give you the snacks that are available for you to eat today. Please feel free to eat as much as you want. I will place them here on the desk so that you will not have to get up to get the food while you play the game.

FIRST, MAKE SURE THAT THE DESK IS CLEARED OF ALL PAPERS, BAGS, ETC. THEN PLACE BOWLS OF FOOD, THE BOTTLE OF WATER, AND THE NAPKIN ON THE DESK IN FRONT OF THE PARTICIPANT. AFTERWARDS, SAY:

Researcher: Feel free to arrange the snacks however you'd like so that you can reach them comfortably. As you drink your water, please keep the cap on after you drink so as to prevent a spill. Before you start the game, I need to call the data center to make sure all of the other locations are ready to go. Feel free to start eating while I make this call.

STEP OUTSIDE THE DOOR TO THE PHONE ON THE FILING CABINET. STAND SO THAT YOU ARE IN THE DOORWAY, SO THAT THE PARTICIPANT CAN SEE YOU HOLDING THE PHONE RECEIVER. DIAL THE NUMBER TAPED ONTO THE FRONT OF THE PHONE, WAIT A FEW SECONDS AS IF YOU'RE WAITING ON SOMEONE TO ANSWER, THEN SAY THE FOLLOWING AS CASUALLY AS POSSIBLE WHILE NOT LETTING THE PARTICIPANT SEE THAT YOU ARE READING THIS FROM THE SCRIPT:

Researcher: Yes, hi. I'm calling from Wayne State. Yes, my participant is ready to start the game. Are the participants at the other locations ready to begin as well? Okay, great. Thank you.

HANG UP THE PHONE AND TURN BACK TOWARDS THE PARTICIPANT AND SAY THE FOLLOWING:

Researcher: Okay, the other participants are ready to play. Before you begin, there is one last thing I need you to know: the game may take anywhere from 5 minutes to 8 minutes. So that I don't disturb you while you're playing the game, I'm going to leave you and come back in 8 minutes to continue with the rest of the study. If the game ends earlier than 8 minutes, I would like you to take that time to reflect on the people you played with. Think about how they behaved during the game and possible reasons why they may have behaved as they did. Also think about your behavior during the game and why you behaved as you did. Do you understand these instructions?

WAIT FOR HER RESPONSE TO MAKE SURE SHE UNDERSTANDS. IF SHE DOESN'T UNDERSTAND, PROBE HER TO FIND OUT WHAT SHE DOESN'T UNDERSTAND. IF SHE DOES UNDERSTAND, SAY:

Researcher: Good. Finally, if you experience any technical problems during the game or spill anything, please notify me right away. Now, unless you have any other questions, click "START PLAYING NOW" to log in and I will be back in 8 minutes.

**IF PARTICIPANT ASKS WHAT SHE SHOULD DO IF THE GAME ENDS BEFORE 8 MINUTES, SAY:**

*Researcher: The time each player is logged into the game is determined by the data center. We were instructed during our training to not disturb each participant for 8 minutes after they start playing the game. Some games may run a few minutes shorter than that, but only the data center knows how long each game will be. Therefore, if the game is shorter than 8 minutes, please sit and wait for me to return to give you further instructions.*

AS YOU LEAVE THE ROOM, PULL THE DOOR SO THAT IT IS ONLY SLIGHTLY AJAR (ENOUGH FOR YOU TO BE ABLE TO LOOK INTO THE ROOM). TAKE THE TIMER WITH YOU WHEN YOU LEAVE THE ROOM AND SET IT FOR 8 MINUTES SO THAT YOU CAN BE SURE TO RETURN IN EXACTLY 8 MINUTES. WHILE THE PARTICIPANT IS PLAYING THE GAME, CHECK TO MAKE SURE YOU HAVE A COPY OF THE POST-GAME QUESTIONNAIRES (CYBERBALL QUESTIONNAIRE, 2<sup>ND</sup> COPY OF THE MOOD SCALE, AND THE 2 POST-GAME QUESTIONNAIRES) ON YOUR CLIPBOARD.

**IF AT ANY TIME DURING THE GAME THE PARTICIPANT NOTIFIES YOU THAT THE GAME HAS STOPPED WORKING, RE-ENTER THE ROOM AND SAY THE FOLLOWING:**

*Researcher: I apologize for the technical difficulties. This software is still new and we are working with the other locations and the data center to work out all of the glitches. Please wait a moment while I call the data center again to make sure the same participants from the game you were playing before are still available. Okay? Thank you for your patience.*

**GO BACK OVER TO THE PHONE AND DIAL THE NUMBER AGAIN. AFTER WAITING A FEW SECONDS FOR "SOMEONE TO ANSWER THE PHONE", SAY THE FOLLOWING (DO NOT LET HER SEE THAT YOU ARE READING THIS):**

*Researcher: Yes, this is Wayne State calling back. We experienced some technical difficulties here and our participant was kicked out of the game. Oh, so it wasn't just our participant, but the other locations experienced the same problem? Oh okay. Oh, you were able to receive enough data? Oh okay then, great. Thank you; you too.*

**TURN BACK TO THE PARTICIPANT AND EXPLAIN TO HER THAT EVERYONE EXPERIENCED THE SAME PROBLEM AND THAT THE DATA CENTER WAS ABLE TO RECEIVE ENOUGH DATA. SAY THE FOLLOWING:**

*Researcher: It turns out the data center was able to receive all of the data they needed from you and the other participants. Therefore, we can now move on with the rest of the study. However, I'll need you to wait here for a few minutes so that I can set up the rest of the study.*

**LEAVE THE PARTICIPANT IN THE ROOM WITH THE FOOD FOR 5 ADDITIONAL MINUTES TO ACT AS IF YOU'RE SETTING UP THE OTHER TASKS. AFTERWARDS, RE-ENTER THE ROOM AND SAY TO THE PARTICIPANT THE FOLLOWING:**

*Researcher: Okay, I apologize for the wait.*

**SKIP DOWN TO THE SECOND RESEARCHER STATEMENT BELOW THAT BEGINS WITH "I HAVE A FEW ADDITIONAL TASKS FOR YOU TO COMPLETE..."**

AFTER THE 8 MINUTES HAS PASSED, RE-ENTER THE ROOM AND SAY THE FOLLOWING:

*Researcher: Is the game over? Okay, now that you are finished playing the game (CONTINUE WITH THE RESEARCHER STATEMENT BELOW).*

*Researcher: I have a few additional tasks for you to complete. In this packet there is a copy of our Cyberball questionnaire, a 2<sup>nd</sup> mood scale, and our post-game questionnaires. Please be sure to answer this second mood scale based on how you feel right now. Take your time to read and answer each question as honestly and openly as you can. Also, please remember to answer each questionnaire in the order in which it is presented. Some of the questionnaires are double-sided, so please make sure to complete both sides of the questionnaires before moving on to the next. I will leave the food with you while you fill out these surveys. I will be just outside the door, so let me know when you are finished.*

LEAVE THE ROOM. WHEN THE PARTICIPANT LETS YOU KNOW THAT SHE IN FINISHED WITH THE POST-GAME QUESTIONNAIRE PACKET, GO BACK IN, COLLECT IT AND CHECK TO MAKE SURE THAT SHE HAS ANSWERED BOTH SIDES OF ALL DOUBLE-SIDED QUESTIONNAIRES.

AFTERWARDS, HAND HER THE COPY OF THE L.A.P. (WORD-SOLVING TASK), WITH THE ACTUAL ITEMS COVERED WITH THE SHEET OF CONSTRUCTION PAPER, LEAVING ONLY THE INSTRUCTIONS AND THE EXAMPLES VISIBLE. SAY THE FOLLOWING:

*Researcher: Thank you. I am now going to give you a copy of our concentration task. Please leave it covered until I instruct you to begin. This concentration task consists of a list of incomplete words. When you begin, you will see that there are 32 incomplete words that you will have to complete. Please try to fill in the blanks to create a real word in the English language for each item. As you can see from the examples, please understand that for some, more than one solution is possible. I will give you 3 minutes*

to complete this task. I will set the timer so that you know when your time is up. When the timer goes off, please stop and put down your pen. Before you begin, please understand that some participants have not been able to complete all the words. Therefore, I want you to know that you will not be penalized for not completing every word. I just want you to do the best you can. Do you have any questions about what I need you to do?

ANSWER ANY QUESTIONS PARTICIPANT MAY HAVE, MAKING SURE THAT SHE UNDERSTANDS THE INSTRUCTIONS CLEARLY. WHEN THIS HAS BEEN ESTABLISHED, SET THE TIMER FOR 3 MINUTES AND SAY THE FOLLOWING:

Researcher: Okay, great. Now when I tell you, remove the top sheet and begin. Again, please remember that you may not complete every word within the 3 minutes, and that's alright. I only want you to do your best to complete as many words as you can. Are you ready? Begin.

AS YOU TELL HER TO BEGIN, HIT THE START BUTTON ON THE TIMER. SIT THE TIMER ON THE DESK IN FRONT OF HER AND LEAVE THE ROOM. GO ASK THE P.I. OF THE PARTICIPANT'S CONDITION. WHEN THE ALARM GOES OFF AT 3 MINUTES, GO BACK IN AND TELL THE PARTICIPANT TO STOP AND TO PUT DOWN HER PEN/PENCIL. IF SHE IS IN THE MIDDLE OF COMPLETING A WORD, ALLOW HER TO FINISH THAT WORD BEFORE YOU REMOVE THE PAPER. ONCE SHE HAS COMPLETED THE WORD, COLLECT THE TASK AND SAY THE FOLLOWING:

Researcher: Thank you. Now I have a few final tasks for you to complete before the session is over. First, I would like to include your height, weight, and waist circumference in our analyses. As such, I need you to remove your shoes and stand so that I can get this information from you.

CLOSE THE DOOR TO REVEAL THE HEIGHT TAPE TO THE PARTICIPANT. HAVE HER STAND WITH HER BACK AGAINST THE WALL SO THAT THE TAPE IS DIRECTLY BEHIND HER. IF PARTICIPANT IS TOO TALL FOR YOU TO READ THE TAPE, USE YOUR FINGER TO MARK HER HEIGHT AND HAVE HER STEP AWAY SO THAT YOU CAN READ WHERE YOU'VE PLACED YOUR FINGER. NOTATE HER HEIGHT ON THE FOOD MEASUREMENT AND HEIGHT/WEIGHT CIRCUMFERENCE SHEET. NEXT, TAKE OUT THE SCALE AND TAKE HER WEIGHT.

**IF SHE EXPRESSES ANY DISCOMFORT IN HAVING TO STEP ON THE SCALE, SAY SOMETHING LIKE THE FOLLOWING:**

*Researcher: I know that you've just finished eating the snack foods, so I realize that you may be a bit self-conscious about weighing yourself. However, I want to reassure you that all information being collected will be kept confidential.*

TO OBTAIN WEIGHT, SIMPLY HAVE THE PARTICIPANT STAND ON THE SCALE AND RECORD IT ACCORDINGLY ON THE HEIGHT/WEIGHT/WAIST CIRCUMFERENCE SHEET. NEXT, TAKE OUT THE WAIST CIRCUMFERENCE TAPE AND SAY:

Researcher: This is the tape we will use to obtain your waist circumference. What I'll need you to do is unroll the tape and wrap it around yourself so that I can take the reading. Make sure that the tape is tight enough around your waist to get an accurate measurement, but not so tight as to be digging into your skin.

DEMONSTRATE ON YOURSELF HOW TO OBTAIN THE CORRECT MEASUREMENT. IF THE PARTICIPANT HAS ON MULTIPLE LAYERS, TELL HER THAT SHE CAN REMOVE A LAYER OR TWO IF SHE WOULD LIKE.

REMEMBER TO OBTAIN WAIST CIRCUMFERENCE, THE PARTICIPANT WILL NEED TO HOLD THE END OF THE MEASURING TAPE TO THE NARROWEST PART OF HER WAIST AND HAVE HER WRAP THE TAPE AROUND HERSELF UNTIL THE TAB ON THE END OF THE MEASURING TAPE CAN FIT INTO THE SLOT. ONCE THE TAB IS IN THE SLOT, PRESS THE BUTTON ON THE MEASURING TAPE TO DRAW THE SLACK. TAKE THE MEASUREMENT AND RECORD ON THE FOOD MEASUREMENT AND HEIGHT/WEIGHT/WAIST CIRCUMFERENCE SHEET. AFTER THIS INFORMATION IS OBTAINED, SAY THE FOLLOWING:

Researcher: Thank you. We are now done with this portion of the study. You can now have a seat and put your shoes back on.

**IF AT ANY TIME THE PARTICIPANT EXPRESSES HER DISCOMFORT AT HAVING TO HAVE HER WEIGHT AND WAIST CIRCUMFERENCE TAKEN, SAY:**

*Researcher: I can see how being weighed after eating would make you uncomfortable, but I assure you that all of your information will be kept confidential and will only be identified with the ID number, and not your name. I apologize for making you feel that way, but I do have a few other questions for you to complete. Are you comfortable enough to continue with the rest of the experiment?*

**OBTAIN ANSWER. IF YES THEN CONTINUE WITH THE REST OF THE STUDY. IF NOT, THEN SAY:**

*Researcher: I am sorry you feel that way. However, the experiment is basically over. The other questions I have to ask you are in regards to how you feel about having participated in the study today. I will also need to debrief you and describe for you why I had you do what you did in today's session. This should only take about another 10 minutes. Is it alright if we continue with those questions?*

**OBTAIN ANSWER. IF YES THEN CONTINUE WITH THE REST OF THE STUDY. IF NOT, THEN SAY:**

*Researcher: I really am sorry that you feel that way. However, I am required by the Human Investigations Committee to fully describe for you the reasons behind why I asked you to do what you did in the study today. Therefore, I will take a few moments to go through this now and then you can leave.*

AFTER THE PARTICIPANT SITS BACK AT THE DESK AND PUTS HER SHOES BACK ON, SIT IN A CHAIR FACING THE PARTICIPANT AND SAY THE FOLLOWING:

Researcher: That was your final study task. However, I have a few more questions to ask you before I can tell you more about the study. The purpose of these questions is to get an estimate of how you are feeling after having participated in today's experiment. Therefore, I ask that you answer each question as honestly and as openly as you can.

READ QUESTIONS FROM DEBRIEFING QUESTIONNAIRE. RECORD ANSWERS IN THE ALLOTTED SPACES AND PROBE IF NECESSARY TO GET A MORE DETAILED RESPONSES. ONCE ANSWER IS COMPLETE, MOVE ON TO NEXT QUESTION.

AFTER ADMINISTERING THE DEBRIEFING QUESTIONNAIRE, CONTINUE WITH THE DEBRIEFING. SAY THE FOLLOWING:

Researcher: We really appreciate that you were willing to participate in the study today. Now that you have answered my questions, I can tell you a little more about the study. Earlier, I told you that we were interested in how hunger affects social interactions and concentration. However, the primary objective of the study slightly differed from what I initially told you. On the consent form, it said that you would be interacting with 3 other people participating in this same study at other universities around Michigan. In actuality, the game you played was a computer program designed to simulate actual people playing a game of toss. This game was specifically programmed to have some participants receive the ball more and for some to receive the ball less. Again, you were not actually playing against other people; the other 3 characters in the Cyberball game you played were pre-programmed to throw the ball as they did. Our primary interest was in the amount of food you ate in response to how often you received the ball. Therefore, as opposed to what we'd told you earlier, everyone gets to eat during the study. Studies have shown that different types of stressors lead some people to eat more than they usually would, and some to eat less. Do you have any questions about this part of the study?

ANSWER ANY QUESTIONS THAT THE PARTICIPANT MAY HAVE. IF YOU AREN'T SURE, ADMIT IT. IF YOU CANNOT ANSWER A QUESTION, YOU CAN ASK THE P.I. TO COME IN AND HELP WITH THE DEBRIEFING.

Researcher: I didn't tell you we were interested in the amount of food you ate in relation to how you were treated by the other participants while playing the game because I

didn't want to influence how much or how little you ate during and after you played the game. I was also unaware of how you were going to be treated in the game because I didn't want my knowledge of this aspect to affect how I treated you during the experiment. Research has shown that when experimenters know that some participants are going to be exposed to potentially stressful materials, they treat them differently than they do those who they know will not be exposed to such materials. It helps make sure all participants are treated the same by keeping me unaware as to how often you were going to receive the ball. Do you have any questions about that part of the study?

ANSWER ANY QUESTIONS THAT THE PARTICIPANT MAY HAVE. AGAIN, IF YOU AREN'T SURE OF HOW TO ANSWER A QUESTION, ADMIT IT. YOU CAN ASK THE P.I. TO COME IN AND HELP WITH THE DEBRIEFING.

Researcher: Now that I have explained everything and you know the details of the study, I'd like you to answer these questions to see how you are feeling now. Your feelings are very important to us, so please answer these questions as honestly and as openly as you can. I'll give you some privacy to answer these questions. Please note that this questionnaire is double-sided.

GIVE THE PARTICIPANT THE PARTICIPANT EVALUATION QUESTIONNAIRE AND LEAVE THE ROOM. WHEN THE PARTICIPANT IS DONE WITH THE EVALUATION QUESTIONNAIRE, REENTER THE ROOM AND COLLECT IT FROM HER.

Researcher: Is it all right if I glance through this to see if I can answer any of your questions or concerns?

IF THIS IS OKAY, THEN LOOK AT HER ANSWERS. ADDRESS CONCERNS AND REASSURE PARTICIPANT (e.g., say: "A lot of people feel the same way").

**IF PARTICIPANT IS STILL NOTICABLY AGITATED, SAY:**

*Researcher: I can't help but notice that you still seem to be a bit upset. Are there any other feelings of injustice or unfairness resulting from today's session that you wish to talk about any further?*

**OBTAIN RESPONSE, THEN SAY:**

*Researcher: I appreciate your honesty and I understand how you can feel that way. Is there anything specific I can do to help you feel better at this time?*

**OBTAIN RESPONSE. IF NECESSARY, GO GET THE P.I. TO COME OVER AND HELP CALM THE PARTICIPANT DOWN. IF SHE CALMS DOWN ON HER OWN AND SEEMS TO LOOSEN UP, NOTATE ALL THAT SHE SAYS AND CONTINUE WITH THE REST OF THE EXPERIMENT.**

Researcher: Thank you for sharing your feelings and for your participation today. Before you leave, please remember that it's very important that you don't discuss this experiment, including the contents and name of the game, as well as the types of snack foods you ate with other Wayne State students since they may participate in the study at some time. As you can see now that you've participated, it's crucial that people don't bring any expectations about the study with them. Also, the conditions of the study vary for different participants. So what happened with you today may or may not happen with another person who participates in the study. This is so important to the experiment that we ask that you sign this agreement that you won't discuss the study with anyone.

REVIEW THE AGREEMENT AND HAVE PARTICIPANT SIGN IT.

Researcher: Thanks, we're really counting on you. As agreed upon in the beginning of the study, you will receive your compensation now. If you win one of the exercise DVDs or the Nintendo Wii, the primary investigator will contact you via email to arrange a time for you to come pick up your prize.

HAND THE PARTICIPANT THE HEALTH BEHAVIORS BROCHURE.

Researcher: This is a brochure containing information on several health topics. I hope that you take the time to read the information. The Primary Investigator's phone number is on your consent form. Feel free to call him if you have any questions about the pamphlet or the study. Now, if you have no further questions, you can gather your things and I can take you back down to the elevator.

ESCORT THE PARTICIPANT TO THE ELEVATOR AND THANK HER AGAIN.  
AT THE END OF THE STUDY MAKE SURE THE PARTICIPANT:

1. IS THANKED
2. SIGNS AGREEMENT
3. IS GIVEN CREDIT THROUGH THE SONA-SYSTEM
4. IS GIVEN ONE COPY OF THE CONSENT FORM
5. IS GIVEN THE INFORMATION PAMPHLET

AFTER PARTICIPANT LEAVES:

1. REPLACE SNACKS ON CART
2. REPLACE DRINKING WATER
3. FILE AWAY ALL FORMS FOR THE PARTICIPANT IN THE APPROPRIATE FOLDER
4. MAKE SURE THE PARTICIPANT NUMBER IS WRITTEN IN THE CORRECT FOLDER
5. CLEAN UP THE PARTICIPANT ROOM
6. EMPTY ANY TRASH



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**ABSTRACT****THE EFFECTS OF RACIALLY-MOTIVATED EMOTIONAL AROUSAL ON THE EATING BEHAVIORS OF AFRICAN AMERICAN WOMEN**

by

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Disparities between African Americans and Caucasians remain vast across a wide variety of health indicators. Chronic stress has been identified as a risk factor for a variety of chronic illnesses and poor health outcomes. One type of chronic stress that has been linked to health disparities is the stress associated with experiences of racial discrimination. The stress African Americans encounter as a result of their racist experiences contributes to a chronic elevation of their physiological stress response. In addition to stress, a major risk factor for coronary heart disease and diabetes is obesity, which has been established as a major health problem in the United States. Obesity in African American women tends to be the result of psychosocial, behavioral, cultural, and environmental factors, among others. The purpose of this dissertation was to investigate possible psychosocial contributions of racism-related stress and the eating behaviors of African American women to their high rates of obesity. Thus, this study was designed to link survey research demonstrating racial discrimination as a stressor with negative effects on health behaviors and outcomes in African Americans with

laboratory studies demonstrating how stress produces binge eating among individuals who typically try to restrain their eating. A number of hypotheses guided this two-part study, which followed a 2 (Eating Style: Restrained vs. Unrestrained Eating) x 2 (Ostracism: Inclusion vs. Exclusion) x 2 (Reference Group: Outgroup vs. Ingroup) design. Three hundred nineteen women participated in Study 1 where they completed questionnaires on their eating behaviors and racist experiences, and 124 of those women participated in the lab portion, Study 2, where they ate snacks as they engaged in an online social interaction with 3 other participants. Results indicate that although the in-lab manipulated experience of discrimination had numerous detrimental effects on psychological well-being, it did not influence the amount of food participants ate in the laboratory. Although many of the hypotheses were not supported, this study may provide procedural precedence for future restrained or emotional eating, racial microaggressions, or social ostracism studies. Results from this study also suggest several useful implications for obesity treatment and prevention programs.



## **AUTOBIOGRAPHICAL STATEMENT**

Lenwood graduated with honors from Morgan State University in May of 2002. The recipient of a full academic scholarship, Lenwood became interested in psychology as a sophomore at Morgan State. Throughout his junior and senior years Lenwood was a scholar in the National Institutes of Mental Health – Career Opportunities in Research program. After exploring several different interests as a research assistant, Lenwood decided that obtaining a Ph.D. in social psychology would best suit his goals. Upon entering Wayne State’s Cognitive, Developmental, and Social Psychology graduate program as a National Institutes of Health – Initiative in Minority Student Development scholar in the Fall of 2002, Lenwood worked to better-establish his interests in the impact perceived racial discrimination has on the psychological and physical health of African Americans. Lenwood looks forward to honing his skills as a researcher at a postdoctoral position before matriculating into a professorship at a research-oriented institution. Lenwood’s dream is to continue to inform and uplift the African American community through not only his research, but also through his provision of patient instruction to all those who come to him in request.