

WHEN DOES OSTRACISM DECREASE SELF-REGULATION?

by

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ABSTRACT

Previous research in social psychology has suggested that ostracism has a negative impact on SE, and also can affect how much food individuals will consume. Moreover, research in the eating disorders literature shows a negative relationship between self-esteem and eating. As such, the present experiment was designed to merge these two lines of research to examine what causal role, if any, self-esteem plays in men's and women's food consumption. It was proposed that some individuals should show a lack of self regulation in terms of the type and amount of food eaten following ostracism. It was also predicted that this effect would have some possible moderators. To test this prediction, participants were randomly assigned to either an ostracism or inclusion condition within the computer game Cyberball. Results indicated that the ostracism manipulation did not result in the anticipated decrease in SE status nor did it cause any significant changes in eating behavior. Nevertheless, significant correlations between SE and body dissatisfaction (BD) were observed, as well as between BD and appearance based rejection sensitivity. There were also significant correlations between body mass index (BMI) and BD, as well as between SE and ARS in both genders. There was also a significant correlation between SE and BMI, but only for male participants. Exploratory analyses revealed that there may have been an unforeseen impact of experimenter gender on eating behavior post ostracism such that self presentation may have impacted the manner in which individuals responded to ostracism.

INTRODUCTION

Although much is understood about the correlates between self esteem (SE) and eating, there is a dearth of information about the explicit causal link between SE and food consumption. Given the recent emphasis on SE in schools and the obesity problem in the USA, the current project set out to examine more precisely what impact SE may have on eating behavior. The main goal of the current study was to examine how ostracism effects SE and how that impact relates to different patterns of eating. Previous research has shown that a greater history of weight-based teasing can negatively predict SE and positively predict disordered eating (van den Berg, Wertheim, Thompson & Paxton, 2001). This relationship needs some causal data to support the directionality of this relationship. A technique of weight based rejection was utilized in this experiment to analyze any effect that this type of rejection may have on SE and eating behavior.

Self-esteem

There is a body of research suggesting that the manner in which an individual evaluates oneself is strongly influenced by the way one believes others view them (Leary, Haupt, Strausser & Chokel, 1998). This subjective self evaluation is referred to as self esteem (SE). One conceptualization of self-esteem maintains that the construct is a relatively stable, enduring, average attitude about the self, albeit one that can fluctuate within a given social context (Heatherton & Polivy, 1991). Other researchers proposed that the concept of SE reflects the amount of competence that an individual feels and a desire to receive favorable evaluations from others (Leary, Haupt, Strausser, & Chokel,

1998). It has been shown that explicit SE can be malleable; depending on social interactions and perceived evaluations by other people in a person's environment (state self esteem). This is a type of explicit SE is consciously accessible. The construct of SE has also been used to describe a motivational factor, whereby SE is an implicit self evaluation that can impact how a person perseveres at any given activity (Deci, Sheinman, & Nezleck, 1981). In this experiment, we will use the term SE to describe a type of explicit malleable self evaluation pertaining to an individual's evaluation of self competence. This particular conceptualization of SE is useful for research on food consumption because it is this type of SE that has been linked to eating behavior in past research (Masheb & Grilo, 2003; Shea & Pritchard, 2007; van den Berg, Wertheim, Thompson, & Paxton, 2001).

Situational Influences on Self-Esteem

One factor that has been shown to have a negative impact on a person's SE state is exclusion from a group, also known as ostracism. In the present study we attempt to determine the direct effect that ostracism has on a person's SE state, as well as the consequences that such changes in SE may have on self-reported body image and objectively measured eating behaviors.

Ostracism occurs when an individual (or whole group) is excluded by another group or individual. Ostracism was originally practiced in ancient Athens as a way of separating groups or individuals in order to assure, or at least reduce the likelihood, that confrontation occurred among members of the society. Today the practice of ostracism is

less formal and carries the connotation of social punishment (Williams, 2007). For example, ostracizing children through the ostracism process of “time out” is a common method of inducing behavioral changes in children (Spencer & Gray, 1973). It seems probable that the reason social groups discipline individuals by ostracism is because of the effect that it has on both on the maintenance of SE and, thereby, on social behavior.

Over the evolution of the human species, it has been advantageous, for survival, for individuals to belong to a community or social group. It has been proposed that because of this basic need to belong in a social group, human beings have developed a monitoring mechanism that signals the individual to act in various ways to gain or maintain inclusion in the group, whenever the potential for exclusion is perceived. This proposed monitoring and adjustment mechanism has been best explained by Sociometer Theory (Leary et al., 1998). This theory posits that pro-social behaviors following ostracism are due to a short-term decrease in SE, which in turn provides a signal necessary for the individual to engage in certain behaviors (i.e., pro-social behaviors), as a way of maintaining or regaining inclusion by the social group and, thereby, maintaining or recovering SE (Leary et. al., 1998).

In response to ostracism, an individual can act in a pro-social manner or in an anti-social manner. Pro-social responses to ostracism or exclusion have been demonstrated in a variety of experimental contexts (Carter-Sowell & Williams, 2005; Williams and Sommer, 1997). One of these contexts is to use the computer ball-toss game known as Cyberball®, wherein participants are ostracized in a mock game depicting a group of people tossing a ball to one another. Ostracized participants, who

received ball tosses less frequently than the confederates in the experiment have been shown to be more likely to conform to unanimous (but incorrect) peer group judgments in perceptual tasks carried out by peers who are not involved in Cyberball (Williams, Cheung, & Choi, 2000). Ostracized participants have also been found to comply more with negotiating techniques, such as the “foot-in-the-door” and “door-in-the face” techniques, than are non-ostracized participants. These types of behaviors are pro-social in nature because they are behaviors that are directed at conforming or agreeing with other people in an effort to be accepted by those people. In each of these examples, a decrement in SE has also been observed along with the pro-social behavioral responses following ostracism. In these cases, it has been proposed that the decrease in SE following ostracism mediates the effect of ostracism on behavior (Williams, 2007). In most cases, the evaluation of SE is based on single item assessments of how much the participant thinks of herself or himself being as adequate as other people. To address this possible weakness in prior research, the present experiment will evaluate SE using the Rosenberg SE scale (Rosenberg, 1962). Although originally designed as tool for the assessment of SE as a trait, with minor re-wording it has been shown to assess short-term changes in the SE state (e.g., Clay, Vignoles, & Dittmar, 2005). The measure of SE derived from the Rosenberg SE scale has also been shown to significantly correlate with the measure derived from other SE state measures (Herman & Polivy, 1991). This scale is directly related to the conceptualization of SE mentioned earlier, in that the questions on this scale assess how an individual evaluates their competence in relation to other people.

Contrasting this pro-social view of the effects of ostracism, other research suggests that individuals sometimes react very anti-socially in response to ostracism. Real world examples abound such situations as the Columbine massacre and the recent school shootings at Virginia Tech. In both cases, stories circulated about how the individuals responsible for these terrible events had suffered years of “social exclusion,” perhaps contributing to extreme anti-social behavior. Several experiments have also demonstrated that social exclusion can lead to aggressive anti-social behaviors. For example, Twenge, Baumeister, Tice, and Stucke (2001) found that participants were more likely to issue a negative evaluation of someone who had excluded them relative to participants who had not experienced the exclusion. In addition, the authors found that excluded participants were more likely to impose an aversive noise to people after they had been excluded from a group. Twenge, Catonese, and Baumeister (2002) also found that social exclusion can lead to increases in self defeating behaviors, such as making unhealthy choices and foolish risk-taking. It has also been shown that ostracism disrupts excluded individual’s reasoning (Baumeister, Twenge, & Nuss, 2002). This has been shown with IQ tests and GRE tests, where excluded individuals perform worse in comparison to participants not excluded. Unfortunately, in none of these experiments was SE measured as a dependent variable, although mood was assessed. For example in one study (Baumeister, Twenge, & Nuss, 2002), mood was assessed by asking participants to rate how they felt generally on a 7-point scale from very negative to very positive. Results showed that excluded participants felt more negative in comparison to participants that were not excluded. Although mood is a different construct than state SE, in that SE is a more global

evaluation of the self, the two have been found to be positively related (Heatherton & Polivy, 1991). For that reason, it is reasonable to hypothesize that SE may have been negatively affected in these studies because mood was negatively affected.

Findings such as these have led to further research suggesting that ostracism may actually decrease an excluded individual's ability to effectively self-regulate their behavior (Baumeister, Ciarocco, & Twenge, 2005). In a recent study, for instance, Baumeister, DeWall, Ciarocco, and Twenge (2005) found that participants ate more cookies following ostracism than following a non-ostracism control condition. They also found that ostracized participants were less willing than non-ostracized participants to drink a bad-tasting but healthy beverage. These two studies led the authors to conclude that ostracism can decrease self-regulation. In this case, self regulation was indicated by the participants' restricting or inhibiting their ingestion of cookies or their increased consumption of the healthy beverage, despite its bad taste. This idea of an ostracism-induced decreased self regulation was further extended in another study described by Baumeister et al. (2005) revealing that ostracized participants, subsequent to ostracism, performed a puzzle for less time than non-ostracized participants. The authors proposed that previously noted reactions to exclusion or ostracism that were interpreted as examples of as anti-social behavior, may actually have been an artifact of participants' inability to self-regulate. It was concluded that participants were not able to inhibit anti-social behaviors because they did not have the cognitive capacity to do so after being ostracized.

Furthermore, if one accepts this self-regulation interpretation of the effects of ostracism, it is reasonable to assume that pro-social responses to ostracism are evidence of increased self regulation. Participants who act pro-socially following ostracism do not seem to suffer from any cognitive deficit, as suggested by Baumeister, DeWall, Ciarocco, and Twenge (2005). For this reason, it seems important to try to understand why some individuals appear to self regulate following ostracism, whereas others appear to lose the ability to self-regulate. It is possible that some variables may be able to explain which ostracism contexts lead to self regulation or whether individual differences may account for these observed differences. This line of research is important for understanding the relationship between ostracism and eating behavior because some ostracism situations may lead participants to consume mass quantities of unhealthy foods, whereas others may lead to a decrease in consumption in comparison to a group of participants that does not undergo ostracism.

Moderating Variables

One possible difference between studies that have found decreased self regulation and the ones where participants behave pro-socially, may reside in what Williams (2007) calls the “reflexive stage” of responding following ostracism. According to Williams, people react reflexively to social exclusion in ways that consolidate the needs induced by the exclusion. In some cases these needs are related to the recovery or maintenance of self-esteem, thus leading to pro social behaviors, whereas in other cases, these needs are related to control over the situation, thus leading to anti social behaviors. Differences in

the nature of the responses to exclusion may depend, in part at least, on the type of exclusion procedures used. In several of Baumeister's experiments, for example, the common exclusion manipulation is to tell some participants to expect their future life to be lonely, which may convince the participant that she or he has no control over being included or excluded in the future. If so, then acting pro-socially might be less likely. In addition, Baumeister and his colleagues do not normally assess SE as a dependent variable, although the effects of a negative mood may be comparable to the effects of reduced SE.

In experiments conducted by Williams and colleagues (Williams, Cheung, & Choi, 2000), the Cyberball exclusion technique, or a real life ball tossing game, is typically used. Participants in this situation may feel as though they have a limited amount of control over the situation, in that if a person behaves pro-socially, the group may choose to include him/her in the future (Williams, 2007). These techniques may threaten SE more than they affect mood, however, there has not been any definite conclusions about when SE is affected or not. The current project will utilize the Cyberball technique in order to manipulate SE and to examine eating post ostracism as a measure of the behavioral effect of this presumed decrease in SE. Consistent with Baumeister's interpretation of exclusion, we expect that ostracism will decrease self-regulation leading to increased consumption of unhealthy foods, conceived as a decrease in one's ability to effectively self regulate.

Another possible explanation for the difference in observed results post ostracism (i.e. anti- vs. pro-social responses) is that individual differences may be important in

understanding food consumption when exclusion is felt. Consistent with this individual differences interpretation, is data showing gender differences in reactions to exclusion. In one study, for example, women responded in a more pro-social manner after exclusion than did men (Williams & Sommer, 1997). Specifically, in a collective task following Cyberball ostracism, men showed more social loafing (i.e., anti-social behavior), whereas ostracized women worked harder than participants who were not ostracized (i.e., pro-socially). Based on this gender difference, the present study will specifically examine the gender differences in SE and eating behavior post ostracism.

Downey et al. (2004) has argued that another individual difference factor may be important. They have proposed that an individual's history of rejection by others (i.e., social exclusion) may result in a defensive mechanism that can lead to anti-social rather than pro-social responses to further rejection. This effect of a history of rejection is presumably evidenced by a person's "rejection sensitivity." Thus, individuals who score high on the Rejection Sensitivity Scale (RS) tend to act anti-socially, perceive rejection even when it is minimal or absent, and expect rejection in social situations more often than individuals who score low in RS and thus behave more pro socially after exclusion or rejection.. As with individual differences presumed to be due to gender, it may be important to assess the possible influence of RS while examining the effects of ostracism on eating behavior. Indeed, Leary (2004) has argued that differences between the genders, as well as differences due to RS, may account for the observed differences in behavioral responses to ostracism. Thus, an assessment of rejection sensitivity was included in the present research in an attempt to evaluate the possible impact of RS on SE

and eating behavior following ostracism. It remains unclear whether individuals who differ in terms of RS will also differ in terms of the effects of exclusion on SE. According to Leary: *“reactions are moderated by the social context, their attributions, assessments of the likely consequences of responding in various ways, and so on”* (Leary, 2004, p. 481). This statement seems to suggest that each of these potentially important individual differences may moderate the effects of ostracism. The present research will explore the moderating effects that gender and appearance based rejection sensitivity have on SE and eating behavior. In the present research, pictures of same sex thin individuals were included as the pseudo participants in Cyberball. This was done to ensure that the type of rejection participants underwent was some type of appearance related rejection. This is also why the appearance related rejection sensitivity scale was employed (Park, 2007).

In accordance with the general notion that individual differences may in part account for differing responses to social exclusion, some researchers have suggested that disinhibition might account for different eating behavioral responses to exclusion or ostracism (Oliver, Huon, Zadro, & Williams, 2001). In general, the term “disinhibition” refers to an individual’s lack of ability to inhibit a particular behavior under certain circumstances. With regard to eating behavior, disinhibition typically refers to overeating when palatable foods are available, when other people are also eating, or when a person is experiencing emotional distress (Stunkard & Messick, 1985). Disinhibition of eating behavior (i.e., over eating or binge eating) has been proposed to result from previous dieting or food restriction. For example, in the eating disorders research field, prior food restriction predicts binge eating (van den Berg, Wertheim, Thompson, & Paxton, 2001).

These authors wanted to examine whether disinhibition score could account for eating differences in response to ostracism. Specifically, they hypothesized that participant's who scored higher on the disinhibition scale would consume more food in response to rejection than those low on the disinhibition scale.

Whether disinhibition of eating may result from factors other than prior food restriction is unclear. However, individual differences in disinhibition have been studied within the context of at least one experiment on ostracism. In this study, conducted by Oliver et al. (2001), individual differences in disinhibition were assessed using the Three Factor Eating Questionnaire (TFEQ); a median split of scores derived from the TFEQ was used to dichotomize high and low disinhibitors. The level of disinhibition each individual reported (high or low) and the type of exclusion experienced were proposed to jointly affect eating. In this study, participants experienced one of two type of exclusion. They were either argued with by another individual or they were ostracized by others. The authors reasoned that ostracism should decrease self-esteem and increase feelings of lack of self-control, whereas argument was proposed to produce emotions such as frustration and anger. Because low SE has often been linked to binge eating (Herman & Polivy, 1980; Polivy, Heatherton, & Herman, 1988), whereas frustration and anger have not, the authors hypothesized that these different conditions would account for differences in food consumption between high and low disinhibitors. Individuals with high levels of disinhibition were expected to eat more food (i.e., show more disinhibition of eating or less self regulation) following ostracism than following argumentation, whereas no difference was expected between low disinhibitors regardless of the type of

exclusion. The results, however, were somewhat surprising. Contrary to predictions, there was no effect of the type of exclusion (ostracism vs. argument), although there was both a significant effect of disinhibition (high or low) and an interaction between level of disinhibition and type of exclusion (ostracism, argument or neither). These results were taken as support for the hypothesis that individual differences (in this case high and low disinhibition scores) may account for some of the variability in eating responses following exclusion. However, the lack of effect of type of exclusion did not shed any new light on whether ostracism and argument result in different types of cognitive or emotional responses. Unfortunately, the role of SE was not examined; however, it may be possible that SE decreased in this experiment due to the ostracism manipulation.

In the present study, we hope to clarify the effect that ostracism may have both on SE and eating behavior. Eating behavior was chosen as the major response variable in this case because eating disorders research has shown that low SE is a strong predictor of binge eating and certain other bulimic symptoms (Masheb & Grilo, 2003; Shea & Pritchard, 2007; van den Berg, Wertheim, Thompson, & Paxton, 2001). In addition, the goal of the present study was to examine the role of the individual difference variables that are presumed to moderate eating behavior and SE as noted above. We suggest that some or all of these individual difference factors may affect the presumed association between ostracism and SE or the presumed association between SE and eating, or both.

Self-esteem, Body Dissatisfaction, and Eating

As noted above, Self Esteem (SE) has been implicated as an important predictive factor for a variety of eating and weight-related problems, including bulimia and binge eating (Masheb & Grilo, 2003; Shea & Pritchard, 2007; van den Berg, Wertheim, Thompson, & Paxton, 2001). In addition, this research has also shown that body dissatisfaction (BD) is negatively associated with SE and positively associated with eating binge eating. BD has been defined as a negative evaluation of one's body image pertaining to three areas of the body (Shroff & Thompson, 2006). In fact, high BD and low SE have both been shown to actually predict the onset of disordered eating behaviors (e.g., bulimia) prospectively in clinical as well as non-clinical samples (Cooper & Fairburn, 1993; Johnson & Wardle, 2005; Paxton, Eisenberg & Neumark-Sztainer, 2006). In these studies, SE and BD are measured as a trait score, meaning that it is an evaluation that is, at least in part, stable across time. However, because it has been proposed that trait SE is an average across several different "states" (Heatherton & Polivy, 1991), it was hypothesized that state SE and state BD would also be related in this experiment. This hypothesis is consistent with other research where BD was manipulated as a state score (Clay, Vignoles, & Dittmar, 2005). In relation to the current project, this research shows that SE predicts eating behavior.

Researchers have developed causal or structural models to describe the relationship among SE, BD, and binge eating (van den Berg, Wertheim, Thompson, & Paxton, 2001). Both prospective and cross-section tests of these models have generally revealed that SE is a partial mediator of the association between BD and bulimic

symptoms, including binge eating. Furthermore, tests of such models have revealed that high levels of BD and low levels of SE can result from appearance-based teasing. The effect of teasing history seems clearly related to social exclusion and, consequently to reduced SE. It therefore seems reasonable to propose that a history of teasing might decrease SE and increase BD and that, either independently or not, changes in SE and BD may lead to increased eating. However, despite that fact that the above eating disorder models are causal, there have been few attempts to test them experimentally. Thus, one of the main goals of the present experimental study was to uncover evidence for causal factors in such models. As a first step, the relationship between social exclusion, SE, BD, and eating behavior will be examined. In this case, the main question is: Does exclusion (by Cyberball ostracism) lead to short-term decreases in SE and increases in eating as has been shown in previous research reviewed above? Because previous research has suggested that eating in response to exclusion may be evidence for a lack of self regulation, we will offer participants three different types of foods that vary in nutrient quality and caloric density. It was predicted that less food restriction would be reflected by relatively greater amounts of consumption of high calorie food that is low in nutrient quality – so-called “junk foods.” Beyond this, will ostracism also decrease reported BD?

The current project assesses the impact of ostracism on BD as well as SE. BD was chosen as a variable of interest because repeated research has demonstrated that it is strongly and negatively associated with self-esteem (Abell & Richards, 1996; Masheb & Grilo, 2002; Wiseman, Peltzman, Halmi, & Sunday, 2007). Further, there is a strong positive association between BD and food restriction, the primary outcome variable in

this investigation (van den Berg, Wertheim, Thompson, & Paxton, 2001). Body dissatisfaction has also been implicated as an independent risk factor that is positively associated with bulimic symptoms (Johnson & Wardle, 2005).

The origin of BD continues to be a topic for debate, although most research shows that high body mass index (kg/m^2) is a significant predictor of BD in both males and females (Lunner et al., 2000; Lynch, Heil, Wagner, & Havens, 2007; Paxton, Eisenberg, & Neumark-Sztainer; van Den Berg, Wertheim, Thompson, & Paxton, 2001; Wiseman, Petzman, Halmi, & Sunday, 2007) with greater body mass commonly associated with greater BD (Paxton, Eisenberg, & Neumark-Sztainer, 2006). In accordance with this research, there was examination of any association BMI has with BD as well as its correlates, SE and eating behavior.

A few experiments have been conducted to determine if BD can be manipulated and if changes in BD due to some experimental manipulation are accompanied by changes in SE (Cahill & Mussap, 2007; Lin & Kulik, 2002). These studies are relevant to the current research study because they show examples of situation where the link between SE and BD has been experimentally demonstrated. Lin and Kulik (2002) exposed females to either thin-peer or oversized-peer faces in a mock dating situation and found that participants in the thin-peer condition had lower BD than females in the oversized peer face condition. However, in this experiment, self esteem did not differ between the two groups. This is interesting because SE has been found to be so highly related to BD and changes in one usually are accompanied by changes in the other (Masheb & Grilo, 2003; Shea & Pritchard, 2007; van den Berg, Wertheim, Thompson, &

Paxton, 2001). This is evidence that the two factors vary independently. In a similar experiment, adolescent girls were exposed to ultra thin models, average-sized models, or no-models (Clay, Vignoles, & Dittmar, 2005). In this study, SE was lower and BD was higher after exposure to either of the models in comparison to the no-model condition. The authors proposed a model that describes BD having a direct negative effect on SE. This model is consistent to the van den Berg, et al. (2001) model in that the direction of the effect of BD upon SE was negative. One interesting aspect about this study is that it found a change in SE where none was present in the study by Lin and Kulik (2002). In the former example, all participants were exposed to some sort of model (either thin or not thin); where in the latter there was a true control condition of no picture exposure. This may account for the fact that SE was unaffected in the study conducted by Lin and Kulick (2002). The explanation given Clay et al. (2005) for the changes in BD and SE is that our culture has accepted a thin ideal, and that internalization of this ideal can lead to increases in BD and decreases in SE, especially when participants are exposed to images of that ideal (Cahill & Mussap, 2007). However, none of these experiments show the possible relationships between BD and SE change, in relation to eating behavior. In the present experiment, we included pictures of same sex thin models in order to expose all participants to the thin ideal. It was believed that the inclusion of these pictures would lead to decreases in SE and increases in BD following ostracism in comparison to the inclusion group. The pictures should also relate to the inclusion of appearance based rejection sensitivity (ARS), in that being sensitive to rejection based on appearance may play a role in the effect of ostracism on SE and eating behavior. One novel part of this

study was that participants would be rejected by others that were emblematic of the thin ideal. This type of rejection could be termed appearance based rejection.

Overview of Hypotheses

The following experiment attempts to isolate the effects of variables previously found to relate to eating behavior and ostracism, in order to determine whether they are causally linked to one another and to eating behavior. In particular the links between BMI, BD, ARS, SE, gender and eating behavior were examined, because previous research has implicated possible causal relationships between these variables and clarification of those relationships is needed.

In this study, it is predicted that the ostracism condition will negatively effect SE and positively effect BD. This prediction is based on the research evidence showing a decrease in SE in response to ostracism as well as evidence, mainly from studies of eating disorders, demonstrating a negative relationship between SE and BD. It is also predicted that participants that undergo ostracism will show a decrease in self-regulation, in that they will consume more unhealthy food products than non-ostracized participants. This effect is expected to differ depending on individual levels of ARS and between the genders. Previous research has suggested that women respond in different manners than men following ostracism. In addition, previous research has suggested that an individual's sensitivity to rejection can lead to different responses to ostracism. We will examine these differences in respect to eating behavior post ostracism. Our control condition will be a group of participants that does not get ostracized by a group.

EXPERIMENT

Method

Participants

Participants were 73 men and 79 women enrolled in Introductory Psychology at Montana State University. All participants were given partial credit for participating in the experiment. Nine participants were excluded from the analysis because of computer malfunctions of the Cyberball program. Of the remaining participants, there were 69 men and 74 women ranging in age from 18 to 46 ($M = 19.93$, $SD = 3.45$).

Procedure

Participants arrived at the laboratory under the impression that they would be participating in a marketing study for the Montana State University psychology department. They were told that this study was designed to test the marketability of different products among college students and they were given an informed consent form to read and sign. The procedure is similar to that used by Frederickson et al. (1998) and Hebl et al. (2004) but was adapted to fit this study with different products that participants were told they would evaluate. When the participants arrived at the laboratory waiting area, the experimenter explained that other participants had already begun the study and that it was important to get them prepared as well. The participants were then led into a room containing the wall mounted ruler, the weight scale, and a tape measure.

Once the consent form was signed, the participant was asked to measure his/her wingspan and foot size, and then was instructed to stand on the weight scale. The participants were led to believe that the wing span and foot size measures were needed for the later testing of some clothing products (e.g., a bathing suit). These instructions and measurements were thought to add to the validity of the product marketing cover story. Following the measurements, participants were told to stand against a white screen for a neck down picture, ostensibly needed for "visualization purposes" for the first product to be evaluated (i.e., the Cyberball program). In fact, the sole purpose of this picture was to convince participants that the pictures of the pseudo-participants, which they would see on the computer monitor during the ball-toss game, were also photos of actual participants in the study who were located in other rooms. Immediately after the picture was taken, the experimenter told the participant to wait while he/she checked on the other participants and entered their picture into the computer in an adjoining room. The experimenter then handed the participant the demographic questionnaire to complete and vacated the room. When the experimenter returned to the room, the participant was informed that the other participants involved in the study were ready to begin testing the first product (i.e., the Cyberball game). The participant was then led across the hall into another laboratory room with a computer. The experimenter told the participant that the Cyberball game was the first product they would evaluate and explained that pictures of the other participants playing the game would appear on the screen once play had begun. It was also explained that the participant's own picture would not be displayed on their screen, but would be seen by the other 3 participants (i.e., pseudo-participants).

Participants were then told that the photos of each participant's body shape were used to enhance each participant's visualization skills. They were also given a product evaluation form to complete once the game was finished and were asked to insert it into a box marked "anonymous" when they were done. The participant was also instructed to prop the laboratory door slightly ajar when the evaluation was complete, to notify the experimenter that he/she was ready for the next product to test. The participant was then told to read the instructions on the computer screen and, when ready, to click "play game." After these instructions were given, the experimenter left the room.

The Cyberball game is a computer simulation of a ball-tossing game, which the participants were led to believe three other participants were also engaged in. The on-screen instructions told participant that this was a game used to assess mental visualization skills and that the game had been shown to be effective in assessing those skills for participants in past research. They were told that tossing and catching the ball did not matter and that the sole purpose was to mentally visualize the other players. This explanation has been used in the past and is described in detail by Williams (2007). It was also explained that the participant would see pictures of the other participants from the neck down, which would help them visualize the other people and the situation. Once the game began the participants saw three other pictures of same-sex individuals who they believed were playing the game with them. The computer randomly assigned participants to be either in the included or excluded condition.

The next two steps of the study were counterbalanced in order to control for the possibility that one may influence the other or that the effect of ostracism may not last

long enough. For half of the participants the experimenter entered another room to set up the food products, which were the next products to be evaluated. These products were weighed (in grams) before they were brought into the participant. The experimenter brought these products into the laboratory after the Cyberball game was completed and instructed the participant to, “Eat as much or as little of each product as you need to judge the taste, smell and texture.” This method followed similar experiments dealing with exclusion and eating behavior (Baumeister, et al., 2005). The participants were also given a product evaluation form which they were told to use to rate each food on taste and likelihood that they would buy each product in the future. After the food evaluation, this half of the participants was presented with the next product to evaluate in the manner described below.

The other half of the participants were given the questionnaire consisting of the BD, SE, and ARS survey items immediately following the Cyberball game. These participants were told that this questionnaire was related to the next product that they would be evaluating. After giving the questionnaire to the participant, the experimenter left the room, telling the participant that he/she would return shortly with the next product. When the experimenter returned, the participant was told that, “There are problems with the next product, and we will therefore have to move on to the final product.” At this time the food products were brought into the room for evaluation, as described previously, for the other participants.

Following the administering of either the questionnaire or the food products, the participants were thoroughly debriefed with special emphasis on the fact that each

participant had been randomly assigned to the ostracism exclusion or inclusion condition. When the participant clearly understood the nature of the exclusion and inclusion treatments, they were thanked and dismissed. Finally, the remaining food was weighed using a balance. This allowed for the calculation of the amount of each food eaten.

Independent Variables

Ostracism: The method of ostracism selected for this experiment was the Cyberball game, downloadable at <http://www.psy.mq.edu/staff/kip/Announce/cyberball>. Pictures seen by participants, representing the other players, were obtained from the Microsoft clothes shopping website (<http://shopping.msn.com/category/shp/?bcatid=4445>) and were used because they represent images commonly thought to be ideal. The images were all of thin clothing models. The game was played on a Dell computer. The game was evaluated post play with questions such as; While working on this game I lost track of time; I would describe this product as very interesting; I am satisfied with my performance on this task; I think that this is a valuable product; I think this is a boring product (7 point scale ranging from strongly disagree to strongly agree). For those participants excluded, the ball was tossed to them only 2 times out of a 45 total throws. For those included, the ball was tossed to them 15 times -- equally as often as to each of the pseudo-participants.

Gender: Each participant was asked to fill out a basic demographic questionnaire requesting gender, ethnicity, marital status, employment status, financial situation,

education, and religious affiliation. Only gender was used in the subsequent data analysis.

Appearance Based Rejection Sensitivity: The Appearance-Based rejection sensitivity scale consists of fifteen 2-part questions, with each part evaluated on a 7-point scale. This questionnaire assesses anxious concern and degree of rejection sensitivity in different hypothetical situations such as: “You are trying on clothes at a department store and notice that you are a few pounds heavier than last week,” “Your new boyfriend/girlfriend bought you a gym membership for your birthday,” or “You are at a dance club and all your friends have been asked to dance except you.” For each item, the participant responded first about how likely this situation was, based on a 6-point scale ranging from very unlikely to very likely and then how concerned they would be if it occurred, based on a six point scale ranging very unconcerned to very concerned. . An overall ARS score was calculated by multiplying the anxious concern score by the degree of rejection sensitivity on each question. The mean of these scores was then used as the overall ARS score (Park, 2007). These questions have been shown to have good internal consistency ($\alpha = .90$), as well as external validity (Park, 2007). This scale also showed good internal consistency in the present study ($\alpha = .86$).

Body Mass Index: A wall mounted ruler was used to take measurements of the participant’s height (in inches); a Tanita BWB-800 scale was used to ascertain accurate weight measurements (in lbs). These measurements were later converted into meters (1 ft

= .3048 m) and kilograms (1 lb = .4536 kg), respectively. These measurements were then used to calculate BMI (m/kg^2).

Dependent Variables

Self Esteem and Body Dissatisfaction: Each participant was presented with a set of questions designed to assess the degree to which the game may have affected their SE and BD. The first question: “When was the last time you bought a bathing suit?” was designed to lead participants to think that the next product they might be testing had to do with bathing suits. This was done to be consistent with the marketing cover story, in that participants were also told that the questionnaire would pertain to the clothing products which they would be testing shortly. Subsequent questions included all 9 items of the Body Dissatisfaction (EDI-BD) subscale of the Eating Disorders Inventory (Garner et al., 1984), intermixed with all 10 items of the Rosenberg Self-Esteem scale (Rosenberg, 1962). The SE and BD sections of this questionnaire were presented as momentary state measures. Thus, participants were directed to respond to each of these items based on how they felt “at that moment.”

The EDI-BD subscale consists of nine questions designed to assess a participant’s satisfaction with three areas of the body (hips, thighs, and stomach). Statements such as: “I think my stomach is too big,” “I think my buttocks are too big,” or “I am satisfied with the shape of my body” were rated on a 6-point scale ranging from never true to always true. Scores were later transformed to range between 0-3 for each question and the mean of these scores was used for subsequent statistical analyses. This

is consistent with typical EDI scoring (Lunner et al., 2000). This scale has previously demonstrated good internal consistency within a similar sample ($\alpha = .91$), as well as good external validity (Limbert, 2004). The current sample also had good reliability ($\alpha = .92$).

The Rosenberg Self-Esteem scale consisted of 10 questions such as; “I am a person of worth, at least on an equal basis with others,” “I am able to do things as well as other people,” or “I feel I do not have much to be proud” were rated on a 4-point scale ranging from Strongly Disagree to Strongly Agree. The Rosenberg SE scale has demonstrated good internal consistency ($\alpha = .88$), as well as external validity (Robins, Hendin, & Trzesniewski, 2001). The current sample also demonstrated good internal consistency ($\alpha = .77$). The mean of all 10 questions was used as the self-esteem score ranging from 1-4.

Food Variables: There were three different foods that the participants could choose from. These foods consisted of individual serving sizes of Bolthouse Farms Baby Carrots, Lays Original Potato Chips, and Planters Honey Roasted Peanuts. These foods were selected based on their relative energy and nutrient densities (Drewnowski, Almiron-Roig, & Lluch, 2004). Nutrition facts were displayed next to each food to assure that the participant knew which foods were the healthiest. The displayed nutritional facts were; calories, fat calories, as well as nutrient and vitamin daily percentages based on a 2,000 calorie diet. The foods were pre-weighed to the nearest hundredth of a gram using a Mettler BasBal balance and placed side-by-side on a tray. A food questionnaire was filled out by each participant following consumption. This questionnaire consisted of the following four questions: Which product did you like the best? Which product would you

be most willing to eat in the future? Which product did you eat the most of? Which product did you eat the least of?

Pictures

A Kodak DC 260 digital camera was used to take a picture of the participant from the waist down, which the person was told would be used in the Cyberball game. This was not the case. The photo was subsequently destroyed. A tape measure also was used to measure the participant's wing span and foot size. These measurements served only for the purpose of providing a believable cover story.

Results

Body Mass Index of the Sample

Body Mass Index was calculated on the basis of measured heights and weights as described above. Independent samples t tests revealed that men ($M = 25.00$, $SD = 8.33$, $n = 69$) and women ($M = 25.18$, $SD = 4.67$, $n = 74$) did not significantly differ on their observed BMI, $t(141) = 1.14$, *ns*. Department of Health and Human Services (2008) BMI norms indicate that a BMI of less than 18.5 represents "underweight," a BMI of 18.5 to 24.9 is "normal weight," whereas a BMI between 25.0 and 29.9 represents "overweight," and a BMI above 30 is "obese." Overall, 1.4 % of the men in the present study were "underweight," 55.1 % were "normal weight," 33.7 % were "overweight," and the remaining 9.8 % were "obese." For women, none were "underweight," 73% were "normal weight," 18.9 % were "overweight" and 8.1 % were "obese." The Center for Disease Control (CDC) has reported that adult males in the United States have a mean

BMI of 26.6; with 0.9% designated as “underweight,” 39.3 % “normal weight,” 39.9 % “overweight,” and 19.9 % “obese” (National Health and Nutrition Examination Survey, 2008). For females, the CDC has reported an average BMI of 26.5; with 2.9% being “underweight,” 45.9 % as “normal,” 25.7 % as “overweight,” and 25.5 % as “obese.”

Examination of Body Mass Index, Body Dissatisfaction, Self Esteem,
and Appearance Related Rejection Sensitivity

Table 1 presents the means and standard deviations for BMI, BD, SE, and ARS as a function of gender. Independent samples t tests revealed that, as predicted, women had significantly higher levels of BD than men. Women also had a significantly higher mean score on the ARS scale than men did. There was no significant difference between men and women in mean SE or BMI scores.

Table 1. *Ms (SDs)* of Appearance Based Rejection Sensitivity, Self Esteem, Body Dissatisfaction, and Body Mass Index. * $p < .05$. ** $p < .01$.

| | Men | Women | t | |
|--|--------------|--------------|------|----|
| Appearance Based Rejection Sensitivity (ARS) | 10.45 (3.76) | 12.97 (4.13) | 3.74 | ** |
| Self Esteem (SE) | 4.05 (.51) | 3.93 (0.47) | 1.46 | |
| Body Dissatisfaction (BD) | 2.96 (4.26) | 7.20 (6.49) | 4.59 | ** |
| Body Mass Index (BMI) | 25.00 (3.83) | 24.18 (4.67) | 1.39 | |

Table 2 presents the correlations between these variables. As predicted there was a significant positive correlation between BMI and BD for both men and women.

Additionally, as predicted, there was a significant negative correlation between BD and SE as well as a negative correlation between ARS and SE in both genders. There was a significant negative correlation between BMI and SE among men. However, this correlation was not significant for women. This was an unexpected result. There was also significant positive correlation for both genders between ARS and BD scores. Again, this was not predicted.

Table 2. Correlations between Body Mass Index, Appearance-Based Rejection Sensitivity, Self Esteem, and Body Dissatisfaction.

| | <i>1. ARS</i> | <i>2. SE</i> | <i>3. BD</i> | <i>4. BMI</i> |
|---|---------------|--------------|--------------|---------------|
| 1. Appearance based Rejection Sensitivity (ARS) | --- | -.36** | .26** | .15 |
| 2. Self Esteem (SE) | -.62** | --- | -.43** | -.24* |
| 3 Body Dissatisfaction (BD) | .45** | -.48** | --- | .49** |
| 4. Body Mass Index (BMI) | .15 | -.10 | .34** | --- |

Note: Correlations for men are above the diagonal; correlations for women are below the horizontal. Tests for significance are two-tailed; n = 69 for men; n = 74 for Women. * $p < .05$. ** $p < .01$

Ostracism, self esteem, and eating behavior

The amount of each food consumed was calculated by subtracting the weight of each food (in grams) post experimental session from the weight of each food pre-experimental session. Independent samples t-tests were conducted on SE, BD, and the eating variables with food-survey order as the independent variable. This analysis was

conducted to assure that there was no difference in these response measures based on the order of presentation on the foods and survey questions. This analysis revealed no significant effect of order of food presentation thus, there was no reason to think that the order in which the food products were presented had any effect on the results.

The main predictions of this study were that ostracism would affect SE, BD, and eating behavior. To examine whether or not ostracism had the predicted effects, two separate multiple regression analyses were conducted with SE and BD as criterion variables. In these analyses; ostracism condition, gender, ARS score, BMI, the six interaction terms, the two three-way interaction terms, and the four-way interaction term served as predictors. Ostracism condition (1 for exclusion and -1 for inclusion) and gender (1 for male and -1 for female) were dummy coded. ARS score and BMI were centered by subtracting the mean from the individual values. The interaction terms were created by multiplying the variables together into new interaction variables.

When SE was regressed on the basic model, the model was significant overall, $F(9,135) = 7.90, p > .05, R^2 = .26$, indicating that the variance in SE could be accounted for, at least in part, by some of our predictors. None of the independent predictors or interaction terms were significant. It was expected that SE would decrease in response to ostracism, but evidence of this was not found. When BD was regressed on the basic model, the model was significant overall, $F(9,135) = 12.41, p < .05, R^2 = .36$, indicating that some of the variance in BD could be accounted for by some of the predictors..

Within this overall significant model, analyses showed a significant main effect of the Gender contrast, ($\beta = -.29, p < .05$) indicating that women reported experiencing more BD

compared to men. ($\beta = .45, p < .05$), such that higher BMI predicted higher BD. No other predictors or interactions were significant.

The next step was to determine whether any of the predictor variables had a significant effect on eating. Separate multiple regression analyses were then conducted on the three different eating variables as criterion variables. The predictors were the same as in the previous regression analysis.

The regression analysis performed when carrots consumed was regressed on the basic model was significant overall, $F(9, 135) = 3.33, p < .05, R^2 = .13$. There was a significant effect of gender ($\beta = .31, p < .001$), such that males consumed significantly more than females. However, there were no other significant predictors. When chips consumed was regressed onto the basic model, the model was not significant overall, $F(9, 135) = 1.60, p > .10, R^2 = .07$. There was a significant effect of gender ($\beta = .25, p = .006$), again revealing that men consumed significantly more than women. In addition, the regression performed when peanuts consumed was regressed onto the basic model, the overall model was not significant, $F(9, 135) = 1.45, p > .10, R^2 = .06$. This analysis revealed that gender was the only significant predictor ($\beta = .24, p = .007$), in this case also showing that males consumed significantly more than females.

It also was reasonable to examine whether the total amount of fat calories consumes differed depending on any of the predictor variables. In order to compute the amount of fat calories consumed by each participant, the proportion of each food consumed was calculated, and that proportion was then multiplied by each foods respective fat calorie content. Again, the predictor variables and interactions mentioned

above were entered into a regression analysis with fat calories consumed as the criterion measure. This analysis revealed that the overall model was not significant, $F(9, 135) = 1.9, p > .05, R^2 = .08$. Similar to the regression analyses done on the other food variables, gender was the only significant predictor ($\beta = .28, p = .002$), such that men consumed more fat calories than women.

Exploratory Analysis of Experimenter Gender Effects

It causes concern that there was no main effect of the ostracism treatment in any of the above analyses. In order to make some sense of this situation, some exploratory analyses were conducted to examine whether or not any other variables might account for the lack of effect of the ostracism treatment. In this study, there were experimenters of both genders. Specifically, female experimenters ran this study 36.4% of the time and male experimenters ran the experiment 63.6% of the time. To examine whether or not experimenter gender made any difference in food consumption, a 2 (ostracism condition) x 2 (participant gender) x 2 (experimenter gender) ANOVA was used with the total amount of fat calories consumed as the dependent measure. This variable was the dependent measure in this case because it reflected fat consumed and if significantly affected would have provided evidence of an ostracism effect on the amount of each food consumed. This analysis revealed a significant effect of gender, $F(5, 135) = 4.97, p < .05$. This significant main effect was qualified by 2 significant interactions. Specifically, there was an interaction between experimenter gender and ostracism condition, $F(7, 135) = 6.54, p < .05$, and a significant interaction between experimenter gender and participant gender $F(7, 135) = 4.65, p < .05$, such that participants with a male experimenter seemed

to consume less fat calories in the ostracism condition than when no ostracism occurred. However, with a female experimenter, results indicated that participants consumed more fat calories in the ostracism condition, in comparison to the condition where no ostracism occurred. Figure 1 illustrates these interactions. A post hoc test was then computed using Tukey's HSD test revealing that there was a significant difference between females who were excluded and included, but only when the experimenter was male, $p = .02$. There were no other significant differences, showing that this effect drove the interactions.

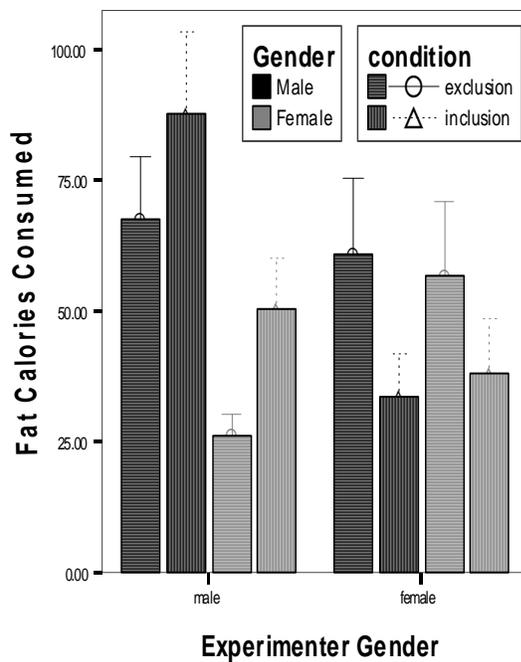


Figure 2. Mean fat calories consumed by participants as a function of experimenter gender, participant gender, and Cyberball condition.

DISCUSSION

The major purpose of the present experiment was to investigate possible effects of ostracism on SE, BD, and eating behavior. It was expected that ostracism would negatively affect SE and increase BD. It was also expected that these changes would lead to some participant's having an inability to self-regulate, thus leading them to engage in behavior that could be construed as anti-social.

Nevertheless, the results of this experiment yielded some unexpected findings. Most obvious, was a lack of effect of the ostracism manipulation on SE. In previous studies the effects of ostracism on SE have been well documented (Williams, 2007). However, common assessments of SE, post ostracism, are one item assessments that may not accurately measure the construct of SE (Williams et al., 2000). In the Williams et al. (2000) study, the one question assessment of SE asked, "To what extent do you think other participants value you as a person?" Similarly, a couple of the questions within the Rosenberg SE scale pertained to perceived competency evaluations of others in the participant's social environment. This was the type of SE that was believed to be synonymous with the conceptualization of Leary et al. (1998), in relation to social exclusion. As mentioned earlier, the perception of social competency has been proposed as a mechanism that signals an individual when to act in pro-social manners to gain inclusion. The fact that there was no effect of ostracism on this overall SE measure may be evidence that an overall self evaluation of social competency is unaffected by ostracism. It may also be that another measure of state SE would capture an effect of

ostracism on SE. Scales, such as the state self-esteem scale (Heatherton & Polivy, 1991) may be superior in capturing the effect that ostracism has on SE.

In addition, the lack of SE effect post ostracism in this study was also qualified by a lack of effect on BD. Although this effect would have been novel, it was expected because of the well documented relationship between SE and BD (Abell & Richards, 1996; Masheb & Grilo, 2002; Wiseman, Peltzman, Halmi, & Sunday, 2007). Therefore, it should not be surprising that there was not any BD change in relation to ostracism because it was expected that BD and SE would both be affected similarly by ostracism.

Another surprising finding was that there was no affect on eating behavior post ostracism. In previous studies, it has been shown that excluding or ostracizing an individual can lead to a lack of self regulation, exhibited by participants increased consumption of unhealthy foods or decreased consumption of a bad tasting but healthy beverage (Oliver et al., 2001, Baumeister et al., 2005). In the present study, three different foods were made available to participants post ostracism manipulation. However, there were not any significantly different eating patterns, regardless of condition. Making three foods available was unlike other similar studies such as Baumeister et al. (2005) where a single food was presented. This was done because it was predicted that making these foods available might result in further evidence of self regulation or a lack thereof.

Gender turned out to be the significant predictor of food consumption with women consuming significantly less of each food than men. This finding shows that males will consume more food in a laboratory setting than women, although it is difficult

to interpret this in terms of the main hypotheses in this experiment. Other experiments conducted using ostracism as an independent variable and food consumption as a dependent variable have either not examined differences in regard to gender (Baumeister et al., 2005) or only had women participants (Oliver et al., 2005).

Further, exploratory analysis done with experimenter gender as a predictor of eating behavior revealed that this variable may have played a role in how participants behaved post ostracism manipulation. The post hoc tests showed that when the experimenter was male, females consumed fewer calories when ostracized than when they were included. One explanation for this effect could be that female participants were self presenting to male experimenters in relation to their eating behavior. Self presentation refers to an individual's need to present themselves favorably to others (Baumeister, 1982). Past research has shown that males confronted with female experimenters expressed less perceived exertion at an exercise task than males confronted with a male experimenter (Boutcher, Fleischer-Curtain, & Gines, 1988). In terms of the current research project, eating may be more of a self-presentation concern for women, where exercise may be more of a concern for men. This would make sense in terms of "ideal" images of both genders, in that the male "ideal" is more athletic and the female "ideal" is thin. It is possible that females confronted with male experimenters were trying to present themselves positively by consuming less, and that this effect is more pronounced when females are ostracized by other females. The need to self-present could have been increased after suffering from ostracism. However, this explanation is simply speculation until it is tested more thoroughly.

The observed BMI's of the participants were somewhat different than other studies reporting on college aged men and women (Neighbors & Sobal, 2007). The present study also had different proportions of men and women within each BMI category than norms reported by the CDC (National Health and Nutrition Examination Survey, 2008). These differences were particularly evident in the underweight category for women. In the present study, there were no women in this underweight category, whereas almost 3% have been found in a national sample. In addition, the present sample had higher proportions of males and females in the normal weight category as well as lower proportions of males and females in the obese category, than the national sample (National Health and Nutrition Examination Survey, 2008). The fact that there was a high proportion of both genders in the normal weight category, may have affected the way that BMI was related to other variables in this study. In particular, there was no relationship between BMI and SE in women, which may have been different, if there had been more women in the "underweight" or "overweight" categories.

There was a significant difference in body dissatisfaction among men and women with women reporting significantly higher mean BD. This is consistent with other studies using the EDI-BD (Joiner, Schmidt, & Singh, 1993). There was also a significant difference in mean ARS scores between women and men. This finding has not previously been reported in past research and is interesting in that "rejection sensitivity" in this case is supposedly a measure of the history of being rejected based on appearance. In the present sample it appears that women have been rejected more frequently in the

past based on their appearance and are more concerned about being rejected based on appearance in the future.

Many of the observed correlations between the self report measures within each gender group were also unexpected. For men, there were significant negative correlations between SE and ARS, between SE and BD, and between BMI and SE. The correlation between BMI and SE for men was particularly unexpected. This is interesting because this negative association was expected, but not observed, for the women of this sample. In the present sample, men with a higher BMI had lower SE. The lack of such an effect in women may have been due to the large proportion of women in the normal BMI category, with fewer than normally expected in the extreme ranges of BMI. The negative association between SE and ARS was observed for both genders of the sample. This is consistent to the results reported by Park (2007) which showed that SE and ARS are directly related in both genders.

In addition, there were also positive correlations between BD and ARS, as well as between BMI and BD for both genders. This finding is consistent with the results reported in the past (Lunner et al., 2000; Lynch et al., 2007; Park, 2007; Paxton, et al., 2006; van Den Berg et al., 2001; Wiseman et al., 2004). It is important to note that ARS and BMI were not related for either gender. This is contrary to what we predicted and shows that a history of rejection based on appearance may not be related to body mass index. However, it is impossible to know how body mass has fluctuated across time in the sample, and thus we also cannot conclude that body mass is unrelated to rejection. It

may be that more recent appearance based rejection history is different than total past appearance based rejection.

Future Directions

It is extremely interesting that the ostracism manipulation did not change SE, BD, or food consumption in comparison to the inclusion condition. It is possible that including pictures of thin models as the pseudo participants in Cyberball had some unexpected effects on BD, SE, as well as eating behavior. The inclusion of these pictures may have altered the normally observed effects of ostracism. The normal animated characters in Cyberball may not lead to the same demand characteristics that these “ideal” images led to. For that reason, this experiment might yield different results if re-run with only the animated characters usually used in the Cyberball computer program.

It may also be useful to conduct more research with only SE as a dependent measure. It may be that the SE construct should be more carefully defined and tested in relation to ostracism. The question of using one assessments of SE versus reliable batteries of questions, such as the Rosenberg SE scale is an important one, and should be addressed in future research. It is possible that the measure of SE did not actually measure state SE as it was intended to do. In fact, It would be possible to utilize a questionnaire such as the State Self Esteem Scale (Heatherton & Polivy, 1991) in future research, although the scale used in the current project has been used as a state measure in past research (Clay, Vignoles, & Dittmar, 2005).

In addition, it may be possible to run this experiment again with the hypothesis that experimenter gender may play a role in the behavioral effects of ostracism. It does seem possible that self-presentation played a role in how the women behaved after being ostracized. Figure 2 is preliminary evidence that experimenter gender may have an effect on the behavioral results of the ostracism condition.

One area that may benefit from this future research is the area of rejection sensitivity. The ARS variable analyzed in this experiment proved to be related to other constructs such as BD, as well as SE. It is important to further investigate the relationship between ARS and BD because BD has been shown to be related to a variety of eating disorders (Masheb & Grilo, 2003; Cooper & Fairburn, 1993). In addition, it may be important to further investigate the relationship between ARS and SE in men. It appears as though these variables are analyzing similar concepts as they relate to the self. For instance, other measures of SE, including the state self esteem scale proposed by Heatherton and Polivy (1991), include items that are directly related to body satisfaction. Therefore, it is possible that BD is only a portion of the overall concept of SE, whether it is a state or trait measurement. In addition, it is interesting that ARS score, BD, and SE were so highly related. Apparently, even though our ostracism technique did not affect SE or BD, there is a link between rejection, SE, and BD. The fact that BD and SE have been linked to eating pathology in past research and that ARS was related to both these measurements makes it clear that ARS may be a helpful tool in predicting a risk of disordered eating.

Conclusions

In this experiment, the ostracism manipulation did not alter SE, BD or eating behavior. This lack of effect is perplexing in that an effect on SE has been observed in numerous previous studies. This lack of effect is most likely because of the inclusion of a valid SE scale that may not measure exactly what other ostracism literature has measured. It may be that the scale chosen measured SE as a trait concept, instead of the intended state concept. There also seemed to be a lack of effect on eating behavior in relation to the ostracism manipulation. This lack of effect is also of interest because other research has shown effects of ostracism on eating behavior. These results make it difficult to understand the relationship between ostracism, SE, and eating behavior in terms of the hypotheses presented.

Despite the lack of effect of the experimental variable, many of the relationships found in the past studies were replicated in the present study. Thus, there was a significant negative relationship found between BD and SE, as well as a positive relationship between BMI and BD. Interestingly, men showed a significant negative relationship between BMI and SE whereas women did not. This may have been due to the large proportion of females that were in the “normal weight” category or it may be initial evidence that men’s SE is closely tied to their body mass, where women’s is not.

In addition, men and women differed in many ways. The measures of ARS and BD showed that women were higher in both measures than men. This gender difference in BD is consistent with previous research, but the gender differences in ARS reported here are novel and deserve replication.

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APPENDIX A

PICTURES OF PSEUDO CYBERBALL PARTICIPANTS

PICTURES OF WOMEN



PICTURES OF MEN

