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Bullying and Sensitivity to Rejection: The Role of Individual Difference Variables in  
Social Exclusion's Impact on Eating Behaviors

Karen M. Ramos

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### Abstract

Social exclusion negatively impacts health behaviors such as eating, and new research suggests that individual difference variables can influence the strength of its effects. Two studies examined whether prior experience with bullying is an individual difference variable that could influence ostracism's impact on food consumption. I hypothesized that people with a history of bullying would be more likely to eat unhealthy foods than healthy foods after experiencing social exclusion, and that this group would likely consume more food after experiencing social exclusion. Neither study found that prior experience with bullying impacted the strength of ostracism's effect on food consumption, although Study 2 demonstrated that Rejection Sensitivity plays an important moderating role in participants' response to social exclusion.

## Bullying and Sensitivity to Rejection: The Role of Individual Difference Variables in Social Exclusion's Impact on Eating Behaviors

Considerable research demonstrates the harmful effects of social exclusion. Social exclusion is problematic not only for social relations and self-esteem, but also for health behaviors such as eating (Salvy, Boweker, Nitecki, Kluzynski, Germeroth, & Roemmich, 2011). Past research mainly assumes that negative effects of ostracism are universal, but recent studies have found that individual difference variables can influence the strength of these effects (Romero-Canyas & Downey, 2005; Twenge & Baumeister, 2005; Williams, 1997). What individual difference variables might moderate the effect of ostracism on eating behaviors?

A history of being bullied is a likely candidate. To examine this possibility, I will first review research on social exclusion and its negative effects. I will then turn to social exclusion's relationship with self-regulation and health behaviors, and those individual difference variables that are known to influence the strength of ostracism's effects. I will next explore the concept of bullying and its harmful impacts. Finally, I will examine how a history of bullying might make a person more susceptible to the effects of ostracism on eating behaviors.

### **Social Exclusion**

Human beings are social creatures. Throughout history, we have formed groups that have provided us with protection from danger and given us the opportunity to flourish as a species. Thus, group membership has, historically, been crucial to survival. As Williams, Forgas, von Hippel, and Zadro (2005) state:

To be rejected and excluded from the group, and thus from all the benefits of membership, would have been a death sentence—left alone without food, shelter, and vulnerable to outside attack, the life of a social outcast would have been brutal and brief. Hence our survival would have depended on our ability to detect imminent rejection and thereby act—cognitively, emotionally, and behaviorally—to regain our membership in the group. (p. 2)

Civilization has since evolved, and with it so have the dynamics of daily existence. However, the potential for exclusion or ostracism, defined as the purposeful ignoring and/or excluding by and of individuals or groups, is still present within our society (Williams et al., 2005; Williams, 2007). Many aspects of our daily lives involve the potential for ostracism. We might experience it in the workplace when a colleague fails to respond to a missed call, at home when a loved one is acting brusque, or on the bus when the person we sit next to suddenly changes seats. Ostracism has remained present in our society, as has our “very primitive and automatic adaptive sensitivity to even the slightest hint of social exclusion” (Williams et al., 2005, p. 2).

Research on the phenomenon of social exclusion began in the 1960s, though the field is “still in its infancy” (Williams et al., 2005, p. 6). Early studies used physical isolation to understand the effects of exclusion, and later studies shifted their focus from physical isolation to psychological isolation. These later studies used a variety of paradigms to induce exclusion including simply shunning a person, explicit group rejection, or group ignoring of an individual. Current research uses three main paradigms to manipulate inclusion and exclusion.

In the first of these three paradigms, participants take a personality test and are given bogus feedback about their test results that divide them into one of three conditions. In the Future Belonging condition, participants are told that they have a personality type that will allow them to experience numerous healthy relationships throughout their lives. In the Future Alone condition, participants are told that they are the type that will end up living a lonely life devoid of long-term interpersonal relationships. A Misfortune Control is also included, and participants in this condition are told that they will eventually become very accident-prone (Baumeister & Dwall, 2005). The Future Alone condition is what most interests researchers, as this is the condition that induces social exclusion.

A second paradigm that manipulates exclusion in current research is a more immediate, current form of exclusion. In this manipulation, participants arrive together and engage in a short, get-to-know-each-other discussion. They are then asked to list which members they would like to work with in a two-person task. Then, each participant is told that he or she will have to work individually for one of two reasons, assigned at random. Half of participants are told that everyone in the group had chosen to work with them, while the other half are told that no one had chosen to work with them. The latter condition is what researchers focus on, as it generates a direct rejection by several other people (Baumeister & Dwall, 2005).

A third paradigm, Cyberball, is of particular relevance for the present study. Cyberball is a well-validated paradigm used to research social exclusion (Williams & Jarvis, 2006). It is a five-minute virtual ball-tossing game that induces inclusion or ostracism (Salvy et al., 2011). In this game, participants falsely believe that they are

tossing a ball to two other people; however, these “people” are simply part of the computer program and their behavior is manipulated by the researcher. The program itself shows three figures on the screen, and each figure is associated with a first and last name. One of these figures holds a ball, which is passed between the “players” through clicking. Participants are randomly assigned either to an inclusion control in which the ball is frequently passed to the participant, or to an exclusion condition in which the ball is largely kept from the participant.

With these differing paradigms, current research has found that exclusion has immediate and pervasive effects on the thoughts, feelings, and behaviors of participants (Williams et al., 2005; Lau, Moulds, & Richardson, 2009). Excluded or rejected people tend to become more aggressive, more self-destructive, less prosocial, and less prone to intelligent thought (Baumeister & Dwall, 2005). Ostracism also has physiological impacts; it has been shown to increase blood pressure and cortisol levels (Twenge & Baumeister, 2005). Of particular relevance to this study are social exclusion’s effects on self-regulation.

### **Social Exclusion and Self-Regulation**

Self-regulation allows us to override naturally selfish tendencies by modifying our thoughts, feelings, and/or behaviors; it helps us adhere to social standards and preserve group acceptance (Baumeister & Dwall, 2005). Because social rejection is often based in people’s objection to one’s behavior, self-regulating by changing disagreeable behaviors would seem a logical thing to do in the face of rejection. Therefore, one might predict that social exclusion would encourage efforts at self-regulation.

In fact, the opposite is true; research indicates that social rejection depletes self-regulatory resources (Salvy et al., 2011; Baumeister & Dwall, 2005). This effect was observed in a study that tested whether socially excluded people would work less at a frustrating task. The ability to persevere is related to self-regulation because it necessitates disregarding the desire to quit working on the discouraging task. This study used the personality feedback exclusion paradigm. After participants received feedback about their futures, they were asked to complete puzzles that had been rigged to be unsolvable. The researchers measured how long participants continued to try to complete the puzzles before giving up. Participants who believed they would have a future without meaningful relationships gave up significantly more quickly than participants in other conditions. This study demonstrates that social exclusion diminishes self-regulation (Baumeister & Dwall, 2005).

Another study conducted by Baumeister and Dwall (2005) used the ability to listen as a measure of self-regulation. Attention control is an important self-regulatory process because it involves redirecting attention away from personal thoughts and environmental distractions and toward the person or people with whom we interact. Thus, the ability to pay attention is vital to achieving social acceptance. This study used the same personality exclusion manipulation paradigm. After receiving false feedback, participants were told to sit at a desk and complete a short listening task. In this task, they would hear a woman speaking into the left ear, while in the right ear they would hear a speech about a policy issue. Participants were told to pay attention to the female voice and to ignore the policy speech, and also to write down all words spoken into the left ear that contained the letters “m” or “p.” Those who thought that they would lead lonely lives

struggled more to regulate their attention than participants in the other conditions; they identified significantly fewer correct “m” and “p” words. This study further demonstrates social exclusion’s deleterious effects on self-regulation. Possibly related to ostracism’s impact on self-regulation is its impact on health behaviors.

### **Social Exclusion and Health Behaviors**

A growing body of research suggests that social exclusion has significant negative effects on health behaviors. Twenge, Catanese, and Baumeister (2002) examined this effect with the false feedback paradigm. After receiving phony feedback, participants were given choices between engaging in healthy behaviors or unhealthy behaviors. These included choosing between a healthy snack or an unhealthy snack and giving a resting heart rate or running heart rate (essentially a choice between running and being sedentary). Those participants who were told that they would later be lonely engaged in about half as many health behaviors as participants who were told that they would have a rewarding social life.

Baumeister, DeWall, Ciarocco, and Twenge (2005) expanded these findings to focus on food consumption specifically. These researchers used the paradigm of partner selection. After inducing social exclusion in half of their participants by telling them that no one wanted them as a partner, the researchers provided participants with cookies for a taste test and measured how many cookies participants consumed. Those who were told no one wanted to work with them ate more of the cookies provided. In both of these studies, experiencing social exclusion led participants to make poor food choices, either by choosing to consume an unhealthy snack or by consuming greater amounts of food.

One possible explanation for people's tendency to eat unhealthfully after experiencing exclusion is that ostracism reduces self-regulatory resources that are necessary for dietary control. The consumption of unhealthy foods is recognized as a contributor to weight gain. Because people must suppress their desire to consume high-calorie and good-tasting foods, restricting consumption qualifies as self-regulation while heavy consumption qualifies as failure in self-regulation. Although the exact inner processes that contribute to self-regulatory failure are unknown, Baumeister and Dwall (2005) suggest that because self-regulation is a mechanism that allows individuals to override their own selfish desires in order to secure social acceptance, people may lose motivation to make sacrifices when social acceptance is denied.

### **Social Exclusion and Individual Differences**

Social exclusion has a powerful and consistently adverse effect on people. Relatively little is known about individual differences in response to ostracism, but what little research has been conducted suggests that individual differences can influence the strength of ostracism's effects. For example, individuals who are high in narcissism tend to become particularly aggressive after experiencing exclusion (Twenge & Baumeister, 2005). The individual difference variable of rejection sensitivity (RS) dictates how people respond to a rejection experience. Those high in RS show higher levels of hostility after experiencing a perceived rejection than do those low in RS (Romero-Canyas & Downey, 2005). Because RS is of particular relevance to this study, I will further examine it shortly.

Given that those high in narcissism and RS respond differently to ostracism, particular populations could be more susceptible to the effects of ostracism on eating

behaviors. In addition to narcissism and RS, what other individual difference variables might influence the strength of social exclusion's effects? It is possible that those who have experienced peer victimization or bullying in childhood and/or adolescence could be more vulnerable to the effects of social exclusion as adults.

### **Bullying and Peer Victimization**

Peer victimization and bullying are phenomena that consist of hurtful behaviors committed by peers (e.g., hitting, teasing, name-calling, and/or ostracism) that are carried out repeatedly over time (Rueger, Malecki, & Demaray, 2011; Staubli & Killias, 2011). Some researchers distinguish between "peer victimization" and "bullying," generally stipulating that bullying is a more active form of hostility that includes an imbalance of power. However, as suggested by Juvonen and Gross (2005), the experiences of rejection in the two forms are similar enough that the terms can be used interchangeably. Bullying and peer victimization can take a variety of different forms, such as physical (e.g., punching), verbal (e.g., calling names), relational (e.g., spreading rumors, ignoring), or a newer form of cyber bullying (e.g., through cell phones or computers; Olweus, 2001; Wang, Iannotti, & Luk, 2010).

Exposure to peer victimization is associated with a number of adverse psychological consequences that can endure through adult life (Frisén, Lunde, & Hwang, 2009; Fosse & Holen, 2006). Those who have been bullied can experience low psychological well-being (e.g., general unhappiness, low self-esteem, and feelings of sadness). They are also more likely to feel high levels of anxiety and depression. Additionally, those who have been bullied are more likely to experience poor social adjustment and are more likely to feel averse to their social environments (Rigby, 2003).

In more severe cases, children who are rejected and bullied are at risk for school dropout, poor mental health, and criminality (Juvonen & Gross, 2005). They are also at greater risk for suicide attempts in early adult life (Staubli & Killias, 2011).

### **Bullying, Ostracism, and Eating Behaviors**

Peer victimization is associated with a variety of negative, persistent psychological consequences, and it is possible that those who have experienced it might be more vulnerable to ostracism's impacts on eating behaviors. This is because experience with repeated rejection is a predictor of rejection sensitivity (RS), a previously discussed individual difference variable. People's experiences with acceptance and rejection can lead them to develop particular coping strategies and behaviors that are activated when acceptance or rejection occurs; sensitivity to rejection dictates how people will respond to a rejection experience. RS develops from a history of repeated rejection and generally leads to maladaptive responses to an occurrence of rejection (Romero-Canyas & Downey, 2005). Rejection is a common element of bullying and usually comes in the form of exclusion or ignoring. Therefore, it is possible that those who have been bullied will be higher in RS and will, accordingly, respond to experiences of rejection in a maladaptive manner.

Individuals who have experienced bullying may also be more vulnerable to the effects of ostracism on eating behaviors because of peer victimization's negative effects on weight-related attitudes and behaviors. For example, Lunde, Frisen, and Hwang (2006) found associations between bullying and negative body esteem and evaluations of weight/appearance in 10-year-olds. These harmful effects do not appear to dissipate; evidence suggests that bullying's impacts on unhealthy eating behaviors and weight

attitudes are long-term. Eisenberg, Neumark-Sztainer, Haines, and Wall (2006) found that over a period of five years, weight-based teasing predicted binge eating, unhealthy weight control behaviors, and frequency of dieting in adolescent boys and girls. Given the associations between peer victimization (weight-based teasing in particular) and disordered eating attitudes and behaviors, those who were bullied in childhood and/or adolescence could be more susceptible to effects of ostracism on eating behaviors.

Self-regulation plays an important role in determining why victims of bullying might be particularly susceptible to ostracism's impact on food consumption. Ostracism's deleterious effects on self-regulation are well-established. Self-regulation is necessary for dietary control; it becomes more difficult to restrict food intake when these resources are depleted (Baumeister & Dwall, 2005). According to Goodsitt (1983), those with eating disordered attitudes have severe deficits in self-regulation. Given the relationship between prior bullying experience and disordered eating attitudes and behaviors, this population may have deficits in self-regulatory resources that could make it even more difficult to resist unhealthy food after experiencing exclusion.

Based on the demonstrated associations between bullying, social exclusion, and eating behaviors, I have generated a model that incorporates these concepts and centers on the observable effect of altered eating behaviors (See Appendix A, Figure 1). This model demonstrates how the individual difference variables of bullying experience and rejection sensitivity might influence a person's food consumption after experiencing social exclusion. Studies have examined the effects of ostracism on eating behaviors, but few have focused on individual differences that might influence what and how much is consumed. This study seeks to address this research gap and, in doing so, may

demonstrate that certain populations are more susceptible to developing unhealthy lifestyles based on past and current experiences with ostracism.

This study will examine the effects of a single episode of ostracism (induced by Cyberball) on participants' eating behaviors, and will then examine these behaviors in relation to whether or not participants have experienced bullying (including weight-based teasing) in childhood and/or adolescence. By inducing ostracism in some participants and then examining their food preference and food intake, the following hypotheses will be examined: (1) People with a past history of bullying will be more likely to eat unhealthy foods than healthy foods after experiencing social exclusion. (2) People with prior bullying experience will also be more likely to consume more food after experiencing social exclusion.

## **Study 1**

### **Method**

#### **Participants**

Fifty-two college students ( $F = 28$ ,  $M = 24$ , mean age = 18.83,  $SD = .99$ ) participated in this study. Almost all of these people participated in this study to fulfill a course requirement for Introduction to Psychology ( $n=51$ ), though one participated out of interest ( $n=1$ ). To control for hunger levels, this study was conducted before and after mealtimes (generally between 2:00 and 5:00 P.M. and 7:30 and 9:00 P.M.). To conceal the true purpose of this study, participants were recruited under a false title: "Two in One: Sleep and Childhood Experiences/ Computer Animation and Sensory Experience." After the study, all participants were asked if they suspected that it consisted of only one experiment; none were aware of its true purpose.

## Measures

**Pittsburgh Sleep Quality Index (modified).** This questionnaire's sole purpose was to convince participants that they were completing two unrelated studies. Because the responses to these questions were not relevant to the outcome of this study, only a few items from the Sleep Quality Index were used (Buysse, Reynolds, Monk, Berman & Kupfer, 1989). The survey was four questions long and asked participants to respond to the following questions based on their sleeping experiences in the last month: (1) What time have you usually gone to bed at night? (2) How long (in minutes) has it usually taken you to fall asleep at night? (3) What time have you usually gotten up in the morning? (4) How many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.)

**The Victim Scale.** The Victim Scale measures different forms of peer victimization (Rigby, 1999). The questionnaire opened with this statement: Please answer the following questions based on your experiences during childhood and adolescence. The original scale consists of five items. Bullying domains included social exclusion ("How often did peers, who you wanted to be with, exclude you?"), name-calling/verbal ("How often were you called unpleasant names?" "How often were you teased?"), and physical ("How often were you threatened with physical violence?" "How often were you hit or kicked?"). Response items for these questions were (1) never, (2) sometimes, and (3) often (See Appendix A).

Some minor changes were made to this questionnaire, resulting in a modified scale of seven items. Because weight-related teasing has been shown to affect eating behaviors (Eisenberg et al., 2006), an additional question measured on the same three-

item scale was added to the verbal bullying section (“How often were you teased about your weight?”). A second change addressed the issue of technology. Given the prevalence of cyber-bullying, it was important that this factor be taken into account. I added a single question based on one created by Fox and Farrow (2009): “How often did you receive nasty phone-calls, text messages, or e-mails?” Responses for this question were measured on the same three-choice scale. At the end of the questionnaire, participants were asked if these experiences occurred during childhood, adolescence, or both. This question was included because duration of victimization has been shown to increase maladjustment (Rueger et al., 2011).

The original Victim Scale has demonstrated adequate reliability:  $\alpha = .83$  for boys and  $\alpha = .77$  for girls. Its validity has also been supported by correlations with a measure of peer victimization based on peer responses:  $r = .45$  for boys and  $.41$  for girls (Rigby, 1997 as cited in Lunde, Frisen, & Hwang, 2006). To examine the reliability of the adapted 7-item Victimization Scale used in this study, Cronbach’s alpha was calculated and was found to be almost as high as the original:  $\alpha = .73$ . Participants were divided into one of two categories (bullied or not bullied) based on their score. Those who scored above the median (10) were categorized as bullied, while those who scored below the median were categorized as not bullied.

**Cyberball.** Participants played the game Cyberball for five minutes. This measure was used because it is a well-validated paradigm used in a great deal of psychological research (Williams & Jarvis, 2006; Williams, 2012). It was also chosen because exclusion is a central element of bullying, and because the experiences of being rejected and being bullied are very similar (Juvonen & Gross, 2005). It is important to note that

this paradigm does not engender long-term negative effects for participants; the effects of the game wear off soon after it ends (Williams & Jarvis, 2006).

**Taste Questionnaire** Like the sleeping habits questionnaire, this was presented only so that participants would think they were completing two studies rather than one. Because responses were irrelevant to the study, the items were created by the researcher. The first question (How did this food taste?) was presented on a 5-point Likert scale (1=very bad, 5=very good). The next question (Did you enjoy this food?) was presented on a similar 5-point Likert scale (1=not at all, 5=a great deal). Participants' actual level of hunger may have influenced the food consumed; a final question addressed this ("How hungry were you before eating this food?") and was measured on a 5-point Likert scale (1=not at all hungry, 5=very hungry).

### **Procedure**

Participants were brought into the lab and instructed to sit at a desk marked "Sleeping Habits and Childhood Experiences (Eliza)" where they read and signed a consent form. This form falsely stated that participants would be completing two separate studies conducted by two different researchers named Eliza and Karen. One would be on childhood experiences and sleep satisfaction and the other would address computer animation and sensory experiences. Upon completion of the form, participants were presented with three questionnaires: basic demographics (completed first), the Sleep Habits Inventory (completed second) and the Victim Scale (completed third). Items were presented in this order so that those experiences that were more relevant to the study (peer victimization rather than sleeping habits) would be more salient as participants

continued the study. They were told to inform the researcher when all three surveys were completed.

Upon completion and collection of both questionnaires, the experimenter instructed participants to move to a computer on a second desk marked “Computer Animation and Sensory Experience (Karen).” Participants were informed that they would be playing a computer game called Cyberball. The experimenter told participants that Cyberball would connect them to two other players to whom they could “throw” the ball by clicking the mouse. Participants were told that during the game it was important to imagine what the other players were like, including how old they were, what they looked like, what kind of computer they were using, etc. They were told that the computer game would last about five minutes, and that they should alert the researcher when the game was over.

To support the cover story that this study focused on sensory experiences, participants were told the following after completing Cyberball: “Computer animation has been linked with changes in sensory experiences, particularly in taste and color preference. In order to examine these changes, we’ll need you to choose between two food items, fill out a Taste Questionnaire, and then rank ten color swatches in order of vibrancy.” Participants were asked to choose between two food items: grapes or similarly sized cookies. However, a slight methodological shift was made after the first twenty-six participants completed the study. Subjects were not asked to pick between the two foods; rather, they were told that they could eat whatever foods they liked. This change was made to offer participants a broader range of eating behavior, as it seemed contradictory to the study’s goals to restrict the consumption response in any way.

To minimize the spread of germs through multiple participants handling the food, the grapes and cookies were placed in two (pre-weighed) clear containers that participants would then pour into paper bowls. They were given the Taste Questionnaire and ten color swatches (gradients of paint colors; available at most hardware/paint stores).

To ensure that the researcher's presence would not influence food consumption, the experimenter explained that she had to go make copies for five or ten minutes while participants ate, filled out the survey, and ranked the swatches. Before leaving, the experimenter casually mentioned to participants that they could eat as much as they liked and left the container in the room. After giving the participants six minutes to eat and complete the survey, the experimenter returned. She then collected the taste form and rankings.

Participants were thoroughly debriefed in person and given a debriefing form. They were asked whether they felt included or excluded by the game, and if their feeling did not match with their assigned condition (e.g., if a person who was in the inclusion condition felt that he or she had been excluded), their responses were recorded. Participants were also asked if they knew the true purpose of the study; none did. After thanking and dismissing participants, the researcher weighed the containers and bowls. Food choice and amount of food consumed were recorded for the first 26 participants (those who were asked to choose between cookies and grapes). Food consumption was also recorded for the following 27 participants (who were told they could eat whatever they liked). Their food choice (healthy vs. unhealthy) was determined by whether they consumed more grams of grapes or cookies.

## Results

**Manipulation Checks.** A manipulation check was conducted to determine whether participants did indeed feel included or excluded by the Cyberball program. All participants in the exclusion condition (27/27) felt excluded. However, 33% of the participants in the inclusion condition also felt that they had been excluded (9/27). Because of the high rate of misperception, I ran additional analyses (described below).

Because hunger level was a potential confound, I conducted a t-test to determine whether the two groups (inclusion and exclusion) differed significantly in hunger levels. They did not,  $t(50) = .439$ , n.s. Therefore, hunger was not considered in subsequent analyses.

**Main Analyses.** This study sought to examine the impact of ostracism on eating behaviors, and specifically focused on whether or not those with prior bullying experience would be more vulnerable to ostracism's impact on food choice and consumption. I first needed to confirm that experiencing exclusion impacted food choice, as found in similar studies (Baumeister et al., 2005; Twenge et al., 2002). Thus, a chi-square analysis was performed to test whether condition influenced food choice; it was not significant,  $\chi^2(1, 52) = 2.160$ ,  $p=0.142$ . This suggests that condition did not influence food choice.

To test the central hypothesis that prior bullying experience influences ostracism's impact on food consumption, I ran a 2 (Condition: Inclusion/Exclusion) X 2 (Bullying experience: Bullied/Not bullied) multivariate analysis of variance on all three food consumption variables (Grapes, Cookies, and Total Food Consumed). No main effect emerged for condition,  $F(2,47) = .10$ , n.s.; contrary to results of past studies, condition

was not a predictor of food consumption. There was also no main effect for prior experience with bullying ( $F(2,47) = .14$ , n.s.); there was also no interaction effect ( $F(2,47) = 1.03$ , n.s.). This suggests that prior bullying experience did not impact food consumption.

Because of the shift in methodology that occurred during the experiment, separate analyses were run for those participants ( $n=30$ ) who were told that they could eat whatever foods they liked (as opposed to those who were told to choose between cookies and grapes). I performed a second chi-square analysis to test whether condition impacted food choice in these latter participants; the results were marginally significant:  $\chi^2(1, 30) = 2.679$ ,  $p=0.1$  (See Appendix B, Figure 1). Those who experienced exclusion were more likely to eat cookies and less likely to eat grapes than those who experienced inclusion. Thus, it appears that condition may have slightly impacted food choice in this smaller set of participants.

To test whether or not condition and prior experience with bullying influenced food consumption among those who got the new instructions, I ran another 2 (Condition: Inclusion/Exclusion) X 2 (Bullying experience: Bullied/Not bullied) multivariate analysis of variance on all three food consumption variables (Grapes, Cookies, and Total Food Consumed). Again, no main effect emerged for condition,  $F(2,25) = .22$ , n.s. There was also no main effect for bullying experience, ( $F(2,25) = .32$ , n.s.). However, there was an interaction effect visible in the grapes:  $F(1,30) = 5.782$ ,  $p = .024$ ; those in the inclusion condition who had experienced bullying ate more grapes than those who were in the inclusion condition and were not bullied. Those in the exclusion condition who had been bullied ate fewer grapes than those in the exclusion condition who had not been bullied

(see Appendix B, Figure 2). There was no interaction effect for cookies ( $F(1,30) = 1.40$ , n.s.) or for total food consumed ( $F(1,30) = 2.94$ , n.s.).

Because so many participants in the inclusion condition felt excluded, I re-analyzed the data of all participants using feelings of inclusion and exclusion rather than condition as an independent variable. It appears that feelings of inclusion and exclusion impacted food choice and consumption. A 2 (Inclusion feeling: Felt Included/Felt Excluded) X 2 (Bullying experience: Bullied/Not Bullied) multivariate analysis of variance on all three food consumption variables revealed a marginally significant interaction effect for feelings of inclusion and bullying for grape consumption:  $F(1,52) = 3.50$ ,  $p = .07$  (see Appendix B, Table 1). Those who felt included and had been bullied ate more grapes than those who felt included and had not been bullied; those who felt excluded and had been bullied ate fewer grapes than those who felt excluded and had not been bullied.

**Exploratory Analyses.** A t-test was performed to examine whether or not gender was related to food consumption. There were no significant differences based on gender for consumption of grapes ( $t(50) = 1.82$ , n.s.), cookies ( $t(50) = -.00$ , n.s.), or total food consumed ( $t(50) = 1.85$ , n.s.) (see Appendix B, Table 2). These results suggest that gender did not impact food choice or consumption. To further examine this possibility, a 2 (Condition: Inclusion/Exclusion) X 2 (Gender: Male/Female) multivariate analysis of variance was conducted on all three food variables. There was no main effect for condition ( $F(1,52) = .01$ , n.s.). There was a marginally significant difference by gender on consumption of grapes ( $F(1,52) = 3.00$ ,  $p = .091$ ); women tended to eat more grapes than males in both the inclusion and exclusion conditions. This effect was not evident for

cookies ( $F(1,52) = .96$ , n.s.) or for total food consumed ( $F(1,52) = 3.17$ , n.s.). There was no interaction effect,  $F(1,52) = .471$ , n.s.

To further examine the role of gender in this experiment, I explored the possibility that the relationship between bullying and food consumption differed for males and females. Correlations computed separately for each gender showed that in women, cookie consumption was positively correlated with being called names,  $r(28) = .43$ ,  $p < .05$ . Weight-based teasing was also positively correlated with cookie consumption in women, ( $r(28) = .56$ ,  $p < .01$ ), as was cyberbullying,  $r(28) = .811$ ,  $p < .01$ . Overall bullying experience was also positively correlated with cookie consumption in female participants,  $r(28) = .45$ ,  $p < .05$ . There were no correlations found for male participants for any of the three food consumption variables. I next examined whether gender was related to overall bullying experience: a t-test revealed that it was not ( $t(50) = -.51$ , n.s.). A second t-test demonstrated that experience with weight-based teasing did not vary by gender,  $t(50) = 1.54$ , n.s.

A series of correlations were computed to see if overall bullying and/or specific types of bullying were related to food consumption. Bullying experience was found to be positively correlated to cookie consumption,  $r(50) = .28$ ,  $p < .05$ . Prior experience with weight-based teasing was also positively correlated with cookie consumption ( $r(50) = .33$ ,  $p < .05$ ), as was past experience with cyber bullying,  $r(50) = .42$ ,  $p < .001$ .

I next examined the relationship between bullying and food consumption as a function of condition. In the inclusion condition, weight-based teasing was positively correlated with cookie consumption ( $r(28) = .540$ ,  $p < .05$ ), as was cyberbullying ( $r(28) =$

.675,  $p < .05$ ). Surprisingly, there were no correlations between the exclusion condition and any of the food consumption variables.

Finally, I explored the potential effects of bullying timing on victimization severity. A univariate analysis of variance demonstrated that timing of bullying had no impact on overall bullying severity,  $F(3, 52) = 2.64$ , n.s.

### **Discussion**

This study sought to examine the impact of social exclusion on eating behaviors, and to determine whether those with prior bullying experience might be more vulnerable to the effects of exclusion on food choice and consumption. Past research (Twenge et al., 2002; Baumeister et al., 2005) has found that experiencing social exclusion can negatively affect health behaviors by causing a person to choose unhealthy food over healthy food and/or consume more calories. However, this effect was not evident in the overall group of participants, and was only marginally present in the subgroup of participants who received different instructions—that is, those who were told that they could eat as much as they liked of either food as opposed to those participants who were told that they could sample only one.

Other studies have found that individual difference variables can influence the strength of ostracism's effects (Twenge & Baumeister, 2005; Romero-Canyas & Downey, 2005). This study did not find that prior bullying experience influenced ostracism's effects on eating behaviors in the overall group of participants; no such relationship was found even when accounting for potential confounding variables such as hunger level and gender.

However, in both the subgroup of participants who received new instructions and in those divided by feelings of inclusion and exclusion, there was a marginally significant interaction between condition, bullying experience, and food choice. This interaction was evident in the healthy food choice (grapes) and not the unhealthy food choice (cookies): those in the inclusion condition who had experienced bullying ate more grapes than those who were in the inclusion condition and were not bullied, and those in the exclusion condition who had been bullied ate fewer grapes than those in the exclusion condition who had not been bullied. These results are rather perplexing. If it is true that those who have experienced bullying are more vulnerable to ostracism's effects, it should have been that those in the exclusion condition who had experienced bullying would have the highest grape consumption—not the least. Furthermore, it is surprising that this effect appeared in the healthy food choice and not the unhealthy food choice, as past research suggests that experiencing exclusion often causes people to gravitate towards unhealthy rather than healthy foods (Baumeister et al., 2005).

Prior research has found that bullying experience can make both women and men more susceptible to unhealthy eating behaviors such as binge eating (Neumark-Sztainer et al., 2006). In line with past research, this study found that weight-based teasing, cyberbullying, name-calling, and overall bullying experience were all correlated with increased cookie consumption. This effect was evident exclusively in women; bullying experience was not correlated with any eating behaviors in the studied male population. This may be because girls are not only teased more than boys are, but they also are more bothered by the teasing they experience (Neumark-Sztainer, Falkner, Story, Perry, Hannon & Mulert, 2002). Although there were no significant differences in bullying

experience between males and females in this sample, women's altered eating behaviors suggest that they were more greatly impacted by their victimization experiences. This may be because the negative effects of peer victimization tend to last longer for girls than for boys (Rueger et al., 2011). There is also evidence of gender disparities in overall dieting and unhealthy weight-control behaviors (Eisenberg & Neumark-Sztainer, 2008). Despite the lack of findings in other aspects of this study, it appears that there is strong evidence for bullying's lasting impact on eating behaviors in women. Therefore, it may be best for future studies to focus exclusively on women.

These results must be examined within the limitations of the study. One factor that may have affected results was the change in methodology that occurred about halfway through the study. Rather than asking participants to choose between cookies or grapes, participants were told that they could eat as much as they liked of both foods; food choice was then measured by determining what item participants consumed more of. This change was made because restricting food intake in any way seemed contrary to the goals of the study. Because only 30 people received these new instructions, my power to detect differences may have been limited.

Furthermore, Cyberball does not appear to be an effective way to induce exclusion in this group of participants. When participants were asked about how included or excluded they felt after the game, several participants in the exclusion condition mentioned that they thought that Cyberball might have been set up to exclude them. It may have been difficult to believe that other people were actually playing such a simplistic game that consisted exclusively of clicking on cartoon figures, and it is

possible that these participants did not experience the full effect of the game as a result of their skepticism.

Additionally, Cyberball did not effectively induce dichotomous states of inclusion and exclusion: a significant minority of participants in the inclusion condition (33%) stated that they felt excluded even though the ball was tossed to them frequently throughout the game. There are a variety of reasons why so many participants in the inclusion condition felt excluded. Study 1 did not measure rejection sensitivity, and it may be that these participants were high in RS and, subsequently, perceived rejection where it didn't exist. Furthermore, the version of Cyberball used was rather unsophisticated. Some versions include pictures of the other players as well as a chat box that allows the participant to talk to these players. Perhaps the addition of these elements would have somehow helped create a more definitive sense of inclusion or exclusion. Cyberball is also a paradigm often used with adolescents (Salvy et al., 2011), and it is possible these college-aged participants were simply too old for this manipulation to be effective.

In addition to Cyberball, another confound could have been the food itself. Because grapes weigh more than cookies—even those that are similarly sized—determining consumption purely based on weight may have been misleading. Future studies should use foods of both similar sizes and weights. Additionally, participants tended to choose grapes over cookies across conditions; food preference may have been an issue. It may be that grapes seemed more appealing than cookies for a number of reasons: grapes are not served at the campus cafeteria, they were cold because they had

been refrigerated, they may have been more palatable than the cookies, etc. Future studies should strive to use foods that are more similar in appeal.

Given the limitations of this study, we cannot draw firm conclusions based on the current results. Although this study did not find that prior experience with bullying moderated social exclusion's impact on eating behaviors, there are hints of effects that warrant further research. As seen in women's cookie consumption, it appears that bullying does indeed alter eating behaviors; additionally, the interaction between bullying, exclusion, and grapes suggests that perhaps there is some kind of link between these concepts that can be revealed through improved studies.

In summary, key issues with this study include problems with food weight and preference, using Cyberball as a means of inducing exclusion, and studying both male and female participants. I also did not measure Rejection Sensitivity, a variable that might nuance how participants respond to incidences of exclusion and help to draw a more accurate picture of the link between social exclusion, ostracism, and eating behaviors. Study 2 seeks to rectify these problems.

## **Study 2**

### **Introduction**

The aim of Study 2 was to further examine potential relationships between prior experience with bullying, social exclusion, and eating behaviors with an improved design. To resolve issues of food weight and preference, participants were given the option to eat two types of M&M candies: regular multi-colored M&Ms and light blue M&Ms that participants were told were low-fat M&Ms (Laran & Salerno, 2012). This allowed participants the option of making what they thought was a healthy choice while

keeping both options consistent in both weight and appeal. Rather than using a computer program to manipulate states of inclusion and exclusion, participants were given short autobiographical writing tasks similar to those used by Baker and Gutfreund (1993). These tasks required participants to reflect on their own personal experiences of inclusion and exclusion. Participation was restricted to females only. A final change to this study's design included the addition of a measure of Rejection Sensitivity.

## Method

### Participants

Thirty-eight female college students (mean age = 19.11, SD = 1.05) participated in this study. Most participated to fulfill a course requirement for Introduction to Psychology (n=35), though some were recruited via e-mail and a social networking website (n=3). This study was conducted before and after mealtimes, so that participants were neither hungry nor full when they engaged in the food consumption task. To conceal the true purpose of the study and its focus on food consumption, participants were recruited under a false title: "Childhood Experiences and Problem-Solving Skills."

### Measures

**The Victim Scale.** This scale was identical to the version used in Study 1, though Cronbach's alpha differed slightly:  $\alpha = .71$ .

**Positive and Negative Affect Schedule (PANAS).** The PANAS is designed to determine levels of positive and negative affect (Watson & Tellegen, 1988). The PANAS was used in this study to help determine whether or not the writing tasks impacted participants' moods. Participants were asked to indicate to what extent they felt each of the 20 emotions (e.g., interested, nervous, attentive), and responses were recorded on a 5-

item scale: (1) very slightly or not at all, (2) a little, (3) moderately, (4) quite a bit, (5) extremely (See Appendix A). I added two items to the list of emotions. The first was “hunger,” and this was done to covertly measure participant’s hunger levels. I also added “tired” so that the addition of “hunger” would not appear suspicious, though I did not record participants’ responses to this item. Participants were asked to describe their states “right now (that is, at the present moment).” The PANAS has demonstrated high reliability:  $\alpha = .88$  for the PA scale and  $\alpha = .87$  for the NA scale (Clark & Tellegen, 1988). Cronbach’s alpha for the overall scale used in this study was slightly lower:  $\alpha = .73$ .

**Rejection Sensitivity Questionnaire (RSQ).** The RSQ assesses anxious expectations of rejection by others, and was created to represent various interpersonal encounters experienced by young adults (Downey & Feldman, 1996). There are 18 items in the questionnaire, and answers vary across two dimensions. The first is degree of anxiety about the outcome, for which responses are measured on a 5-point scale ranging from (1) very unconcerned to (5) very concerned. The second dimension is expectation of rejection or acceptance. Responses for this dimension are also recorded on a 5-point scale which ranges from (1) very unlikely to (5) very likely (See Appendix A). Both dimensions are generally measured on a 6-point scale. However, due to a clerical error, participants answered based on a 5-point scale. The RSQ demonstrates high reliability:  $\alpha = .83$  (Downey & Feldman, 1996). Cronbach’s alpha for this study was even higher:  $\alpha = .86$ .

## **Procedure**

Participants were brought into the lab and asked to complete a consent form. They were then presented with a short demographic questionnaire and the Victim Scale. Upon completion of these forms, they were presented with one of two autobiographical writing tasks in order to induce states of social exclusion or inclusion (Baker & Guttfreund, 1993). Those in the exclusion condition were presented with the following prompt: “For the next 10 minutes, please write about a time when your peers treated you poorly by excluding you. Please include as much detail as possible.” Those in the inclusion condition were presented with a different prompt: “For the next 10 minutes, please write about a time when you really enjoyed being with your peers, and they really enjoyed being with you. Please include as much detail as possible.” After giving participants the writing tasks, the researcher told participants that they could eat some M&M’s if they liked. These M&M’s were weighed before the session began so that the researcher could determine how much each participant consumed.

She told participants the following: “I also have some M&M’s here if you want them—the Psych department ordered them for a social and there were a bunch left over. The multicolored ones are regular M&M’s and the light blue ones are low-fat, if that matters to you at all. Feel free to have as many as you want.” To prevent the spread of germs through contact with food items, participants were again given bowls for their food. To make sure that her presence did not influence participants’ food consumption, the researcher told participants that she would step out while they completed the task. The researcher timed participants for 10 minutes exactly and then returned to collect their essays. Participants were then given the PANAS and the RSQ and were told to alert the researcher upon completion of the surveys.

Next, the researcher told participants that she was interested in the relationship between childhood experiences and problem-solving tasks, so they would be solving “wordles,” or word-based puzzles. This was simply a filler task used to give participants a chance to eat the M&Ms. After giving the “wordles” to participants, the researcher told them that they would have 10 minutes to solve the puzzles and that she would step out during that time. Again, the researcher left to ensure that her presence did not alter participants’ food consumption. They were instructed to solve as many puzzles as they could while she was gone.

After 10 minutes, the researcher returned and collected the word puzzles. She thanked participants, gave them a copy of the consent form, reminded them that they could contact her if they had any questions or concerns, and told them they were finished. Participants were e-mailed a full debriefing form when the experiment was completed.

## Results

**Manipulation Checks.** A manipulation check was conducted to determine whether writing about experiences of inclusion or exclusion altered participants’ moods. Participants in the inclusion and exclusion conditions did not differ significantly in positive affect ( $t(36) = .75$ , n.s.) or negative affect ( $t(36) = .15$ , n.s.).

Because hunger level was a potential confound, I conducted a t-test to determine whether the two groups (inclusion and exclusion) differed significantly in hunger levels. They did not:  $t(36) = .02$ , n.s. Therefore, hunger was not considered in subsequent analyses.

**Main Analyses.** This study sought to examine the impact of ostracism on eating behaviors, and specifically focused on whether or not those with prior bullying

experience would be more vulnerable to ostracism's impact on food choice and consumption. I first needed to confirm that experiencing exclusion impacted food choice, as found in similar studies (Baumeister et al., 2005; Twenge et al., 2002). Thus, a chi-square analysis was performed to test whether condition influenced food choice; it was not significant,  $\chi^2(1, 38) = .110, p=0.74$ . This suggests that condition did not influence food choice.

To test the central hypothesis that prior bullying experience influences ostracism's impact on food consumption, I ran a 2 (Condition: Inclusion/Exclusion) X 2 (Bullying experience: Bullied/Not bullied) X 2 (Candy Type: Regular M&Ms/Low-Fat M&Ms) mixed model analysis of variance; Condition and Bullying were between-subject variables, and Candy Type was a within-subject variable. There was no main effect for Candy Type, ( $F(1,34) = .22, n.s.$ ) or for Bullying ( $F(1,34) = 1.23, n.s.$ ). There were no interaction effects for Candy Type and Condition ( $F(1,34) = 1.4, n.s.$ ) or for Candy Type and Bullying ( $F(1,34) = .97, n.s.$ ). There was also no interaction effect for Candy Type, Condition, and Bullying,  $F(1,34) = .26, n.s.$  This suggests that bullying experience does not influence ostracism's effect on food consumption.

Although prior bullying experience did not influence exclusion's impact on eating behaviors, it was possible that rejection sensitivity did. Therefore, I computed a 2 (Candy Type: Regular M&Ms/Low-Fat M&Ms) X 2 (Condition: Inclusion/Exclusion) X 2 (RSQ Score: High/Low) mixed model analysis of variance. This test was conducted with Candy as a within-subjects factor and with Condition and RSQ score as between-subjects factors (high vs. low scorers on the RSQ were determined using a median split). There was no main effect for Candy Type,  $F(1,34) = .012, n.s.$  or for Condition,  $F(1,34)=.56, n.s.$  but

there was a significant effect for RSQ ( $F(1,34)=8.90, p=.005$ ); regardless of condition, participants who were high in rejection sensitivity ate more “low-fat” and regular M&Ms than those who were low in rejection sensitivity. There were also no interaction effects for Candy Type and Condition ( $F(1,34) = 2.16, n.s.$ ) or for Candy Type and RSQ score ( $F(1,34) = .075, n.s.$ ). However, there was an interaction effect for Candy Type, Condition, and RSQ score,  $F(1,34) = 4.15, p < .05$ . Highly rejection sensitive participants in the inclusion condition ate more “low-fat” M&Ms, while highly rejection sensitive participants in the exclusion condition ate more regular M&Ms (see Appendix B, Figure 3). Two paired-samples t-tests demonstrated no differences in grams consumed of “low-fat” M&Ms by low RS participants ( $t(26) = 1.43, n.s.$ ) and grams consumed of regular M&Ms by high RS participants ( $t(12) = -1.62, n.s.$ ). A final t-test ensured that RSQ scores did not differ by condition,  $t(36) = -2.38, p < .05$ .

**Exploratory Analyses.** I ran a series of correlations to further examine the connections between bullying, social exclusion, and food consumption. First, I examined whether overall bullying and/or specific types of bullying were related to food consumption as found in Study 1. Experiencing exclusion in one’s past was negatively correlated with the consumption of regular M&Ms ( $r(36) = -.40, p < .05$ ) and with total candy consumption ( $r(36) = -.47, p < .01$ ). Prior experience with hitting was positively correlated with regular M&M consumption:  $r(36) = .36, p < .05$ . Experience with weight-based teasing was positively correlated with the consumption of low-fat M&Ms:  $r(36) = .34, p < .05$ .

Although bullying experience did not impact participants’ food consumption (despite correlations between specific types of bullying and candy consumption), the 2

(Candy Type: Regular M&Ms/Low-Fat M&Ms) X 2 (Condition: Inclusion/Exclusion) X 2 (RSQ Score: High/Low) mixed model analysis of variance demonstrated that rejection sensitivity influenced the amount and type of candy participants consumed (regular vs. low-fat) in the inclusion and exclusion conditions. Because rejection sensitivity develops from a history of repeated peer rejection, I next examined whether specific experiences of bullying and/or overall bullying correlated with RSQ scores. There were no significant correlations between specific or overall bullying experiences and rejection sensitivity.

Finally, I explored the potential effects of bullying timing on victimization severity. A univariate analysis of variance demonstrated that timing of bullying had no impact on overall bullying severity,  $F(2, 38) = .29$ , n.s.

### **Discussion**

This second study sought to further examine the impact of social exclusion on eating behaviors, and to determine whether those with prior bullying experience might be more vulnerable to the effects of exclusion on food consumption. Past research (Twenge et al., 2002; Baumeister et al., 2005) has found that experiencing social exclusion can cause a person to pick unhealthy food over healthy food and/or consume more food. However, this effect was not evident in Study 2: experiencing social exclusion did not influence participants' food choice. Given that social exclusion's impact on eating behaviors is an effect evidenced by a variety of studies, it may be that the form of exclusion induction used in this experiment was not entirely effective: perhaps writing about a personal experience of social exclusion was not enough to fully induce a state of exclusion in participants.

The central hypothesis of this experiment was that prior experience with bullying might be an individual difference variable that could influence the strength of ostracism's effect on food consumption. While other studies have found that individual difference variables can influence the strength of social exclusion's effects (Twenge & Baumeister, 2005; Romero-Canyas & Downey, 2005), this study did not find that prior bullying experience impacted ostracism's effects on eating behaviors.

However, some elements of bullying were related to food consumption patterns. Those who had experienced weight-based teasing ate more "low-fat" M&Ms. This finding is easy to make sense of; those who have experienced weight-based teasing are more likely to develop disordered eating attitudes and behaviors such as negative evaluations of weight/appearance and frequency of dieting (Lunde et al., 2006; Neumark-Sztainer et al., 2006). It may be that these participants ate more "low-fat" M&Ms because they believed them to be less contributory to weight gain. I also found that those who had experienced exclusion in the past ate less candy overall. This finding is somewhat perplexing, especially given the demonstrated importance of rejection sensitivity in participant's food consumption. Rejection sensitivity develops from a history of repeated rejection, so those with a great deal of experience with exclusion would likely be high in sensitivity to rejection (Romero-Canyas & Downey, 2005). They would, accordingly, respond to rejection in a maladaptive fashion—presumably by consuming *more* M&Ms rather than fewer.

This study found that rejection sensitivity plays an important role in participants' food intake in response to social exclusion. Those with high RSQ scores showed a maladaptive response to writing about an experience of peer rejection: highly rejection

sensitive participants in the exclusion condition ate more regular M&Ms than “low-fat” M&Ms. Participants with high RSQ scores in the inclusion condition showed the reverse pattern: they consumed more “low-fat” M&Ms than regular M&Ms after writing about a time where they felt included by their peers. Highly rejection sensitive participants in both conditions ate more M&Ms overall than did participants who were low in rejection sensitivity. Although it is possible that the task of describing a social experience—whether the experience was positive or negative—was enough to impact the eating behaviors of highly rejection sensitive participants, further testing is necessary to conclude that the prompt was indeed what caused these altered eating behaviors. Additionally, rejection sensitivity was not linked with specific or overall bullying experiences, which is surprising considering that, at least theoretically, rejection sensitivity develops from a history of repeated rejection.

### **General Discussion**

These studies were conducted in the hopes of finding that bullying is an individual difference variable that moderates the effect of social exclusion on eating behaviors. However, neither Study 1 nor Study 2 demonstrated that prior experience with bullying influenced the strength of ostracism’s effect on food consumption. Why didn’t experience with bullying matter in participants’ responses to social exclusion? Perhaps people are more resistant to the negative effects of bullying than research suggests. It may also be that some individual aspects of bullying play a larger role than others; for example, both studies demonstrated that prior experience with weight-based teasing was related to later food consumption, while there was no such evidence discovered for aspects such as being threatened by physical violence. It is also possible that participants

had addressed their experiences with bullying in ways that negated its harmful effects; participants could have worked through potentially traumatizing experiences of bullying either on their own or with the help of a professional. Working past harmful experiences with bullying would have allowed them to respond to exclusion in a healthy manner and would have led to no observable effect of bullying experience despite the fact that it had occurred.

However, given the depth of literature that draws these concepts together, it seems more likely that prior experience with bullying *is* an individual difference variable that determines how people will respond social exclusion, but that these two studies were unable to detect its presence.

There are a variety of reasons this may have occurred. The first is the questionable effectiveness of the two design paradigms used; it may be that they were not entirely successful in inducing exclusion, as both studies failed to fully replicate the previously observed effect of social exclusion on eating behaviors. In Study 1, this effect was only marginally present with healthy food, and this effect was not present at all in Study 2. It does not appear that these paradigms induced exclusion in a way that leads to the kind of self-regulatory failure observed by Baumeister and Dewart (2005). This is somewhat confusing considering the similarities between samples in these studies, which have largely focused on college students. The Victim Scale may also not be sensitive enough to fully measure participants' experiences with bullying. Responses are recorded on only a three-point scale; bullying experience might be better captured with a wider range of response options that allow participants to speak to the severity of their peer victimization. It also does not include a space for participants to indicate the duration of

their bullying experience. Additionally, participants' responses were based on retroactive reflections of previous experiences, which may not have been entirely accurate.

Participants were asked to answer questions based on their experiences during childhood and adolescence, and may have distorted or misremembered their experiences with peer victimization.

The major finding of this study is that rejection sensitivity plays an important moderating role in participants' response to social exclusion. A maladaptive response was observed for all high RS participants, and it was particularly evident in those who were highly rejection sensitive and had experienced exclusion. These participants chose regular M&Ms over "low fat" M&Ms and ate more candy. Thus, those high in rejection sensitivity appear not only to react maladaptively to occurrences of rejection, but also to experiences that have already occurred and are later revisited. It is worth noting that those who were high in rejection sensitivity ate more M&Ms regardless of condition. It is possible that the task of writing about social experiences alone is enough to elicit some kind of maladaptive response from this group, though an additional control condition would be necessary to fully examine this possibility. Testing high and low RS participants' food consumption after some participants were wrote about something neutral (e.g., their favorite color) would reveal whether increased food consumption was an effect of the prompt or of factors unrelated to the study.

What are the origins of rejection sensitivity? According to Romero-Canyas and Downey (2005), it develops from a history of repeated rejection. However, this study did not find that a history of social exclusion, a common element of bullying, had any kind of relationship with scores on the RSQ. Perhaps rejection sensitivity arises from a particular

form of peer rejection. The Victimization Index may also miss a key aspect of rejection; the rejection sensitivity model recognizes the importance of parental rejection in development, and the Victimization Index asks participants to answer solely based on their experiences with peers (Watson & Nesdale, 2012).

Ideally, future studies will have resources that allow researchers to test these hypotheses more fully. A longitudinal study in which participants reflect on their bullying experiences as they occur, shortly after they occur, and long after they occur would be ideal. If researchers could then measure their food choice and consumption after these participants had matured and undergone a well-validated paradigm of manipulating inclusion and exclusion, they could better understand the effects of bullying in food consumption as a response to social exclusion. It would also be best to examine self-regulatory behaviors such as eating in a more naturalistic setting. This would allow participants to respond to social exclusion in a way that more closely approximates everyday life. It would also be beneficial to examine additional variables such as self-regulation capabilities and eating/weight attitudes (including diet history), as these variables could play a role in how much food participants consume.

The studies described in this paper suggest that that prior experience with bullying is not an individual difference variable that impacts the effects of ostracism on eating behaviors. However, rejection sensitivity does affect how people will respond to experiences of social exclusion. Human beings are social creatures, and we respond to social interaction in ways that can have serious consequences. Because occurrences of rejection are incredibly common, future research is necessary to understand how and why some people respond to rejection in maladaptive ways; this is particularly important when

it comes to eating and health behaviors, because some are at a higher risk for the implications of rejection on their health and physical wellbeing. By developing a better understanding of what factors build resilience and which compromise us, we can help guide people in living happier, healthier lives.

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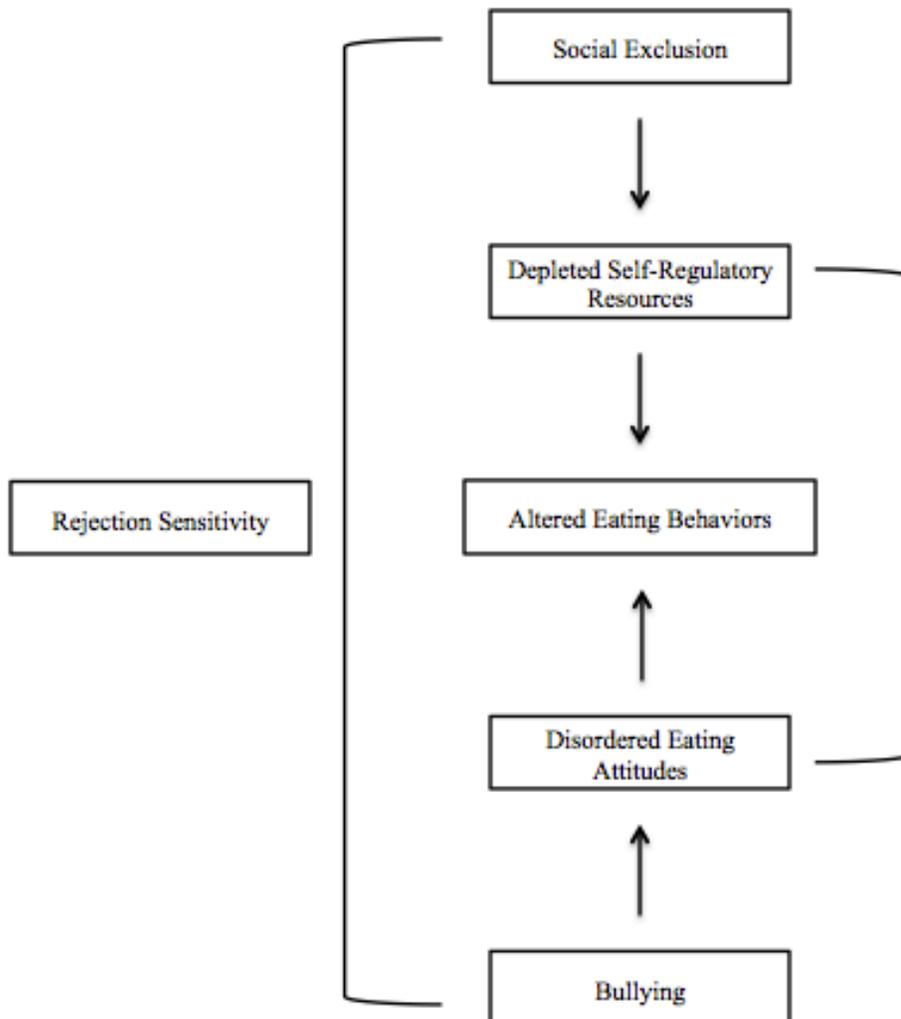
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## Appendix A



*Figure 1.* Hypothesized model predicting altered eating behaviors in the bullied and excluded.

Victim Scale

Please answer the following questions based on your experiences during childhood and adolescence.

How often did peers, who you wanted to be with, exclude you?

1	2	3
Never	Sometimes	Often

How often were you called unpleasant names?

1	2	3
Never	Sometimes	Often

How often were you threatened with physical violence?

1	2	3
Never	Sometimes	Often

How often were you hit or kicked?

1	2	3
Never	Sometimes	Often

How often were you teased?

1	2	3
Never	Sometimes	Often

How often were you teased about your weight?

1	2	3
Never	Sometimes	Often

How often did you receive nasty phone-calls, text messages, or emails?

1	2	3
Never	Sometimes	Often

When did these experiences occur? Please circle one.

Childhood	Adolescence	Both
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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= very slightly or not at all	2= a little	3= moderately	4= quite a bit	5= extremely
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<input type="checkbox"/>	interested	<input type="checkbox"/>	irritable
<input type="checkbox"/>	distressed	<input type="checkbox"/>	alert
<input type="checkbox"/>	excited	<input type="checkbox"/>	ashamed
<input type="checkbox"/>	upset	<input type="checkbox"/>	inspired
<input type="checkbox"/>	strong	<input type="checkbox"/>	nervous
<input type="checkbox"/>	guilty	<input type="checkbox"/>	determined
<input type="checkbox"/>	scared	<input type="checkbox"/>	attentive
<input type="checkbox"/>	hostile	<input type="checkbox"/>	jittery
<input type="checkbox"/>	enthusiastic	<input type="checkbox"/>	active
<input type="checkbox"/>	proud	<input type="checkbox"/>	afraid
<input type="checkbox"/>	hungry	<input type="checkbox"/>	tired

RSQ**1. You ask someone in class if you can borrow their notes.**

Please indicate your degree of anxiety about the outcome of this situation.

1	2	3	4	5
very concerned				very unconcerned

Please indicate the likelihood that the other person would respond in an accepting fashion.

1	2	3	4	5
very unlikely				very likely

**2. You ask your significant other to move in with you.**

Please indicate your degree of anxiety about the outcome of this situation.

1	2	3	4	5
very concerned				very unconcerned

Please indicate the likelihood that the other person would respond in an accepting fashion.

1	2	3	4	5
very unlikely				very likely

**3. You ask your parents for help in deciding what programs to apply to.**

Please indicate your degree of anxiety about the outcome of this situation.

1	2	3	4	5
very concerned				very unconcerned

Please indicate the likelihood that the other person would respond in an accepting fashion.

1	2	3	4	5
very unlikely				very likely

**4. You ask someone you don't know well out on a date.**

Please indicate your degree of anxiety about the outcome of this situation.

1	2	3	4	5
very concerned				very unconcerned

Please indicate the likelihood that the other person would respond in an accepting fashion.







very unlikely

very likely

**16. You ask your significant other if they really love you.**

Please indicate your degree of anxiety about the outcome of this situation.

1	2	3	4	5
very concerned				very unconcerned

Please indicate the likelihood that the other person would respond in an accepting fashion.

1	2	3	4	6
very unlikely				very likely

**17. You go to a party and notice someone on the other side of the room, and then you ask them to dance.**

Please indicate your degree of anxiety about the outcome of this situation.

1	2	3	4	5
very concerned				very unconcerned

Please indicate the likelihood that the other person would respond in an accepting fashion.

1	2	3	4	5
very unlikely				very likely

**18. You ask your significant other to come home to meet your parents.**

Please indicate your degree of anxiety about the outcome of this situation.

1	2	3	4	5
very concerned				very unconcerned

Please indicate the likelihood that the other person would respond in an accepting fashion.

1	2	3	4	5
very unlikely				very likely

**Appendix B**

Table 1

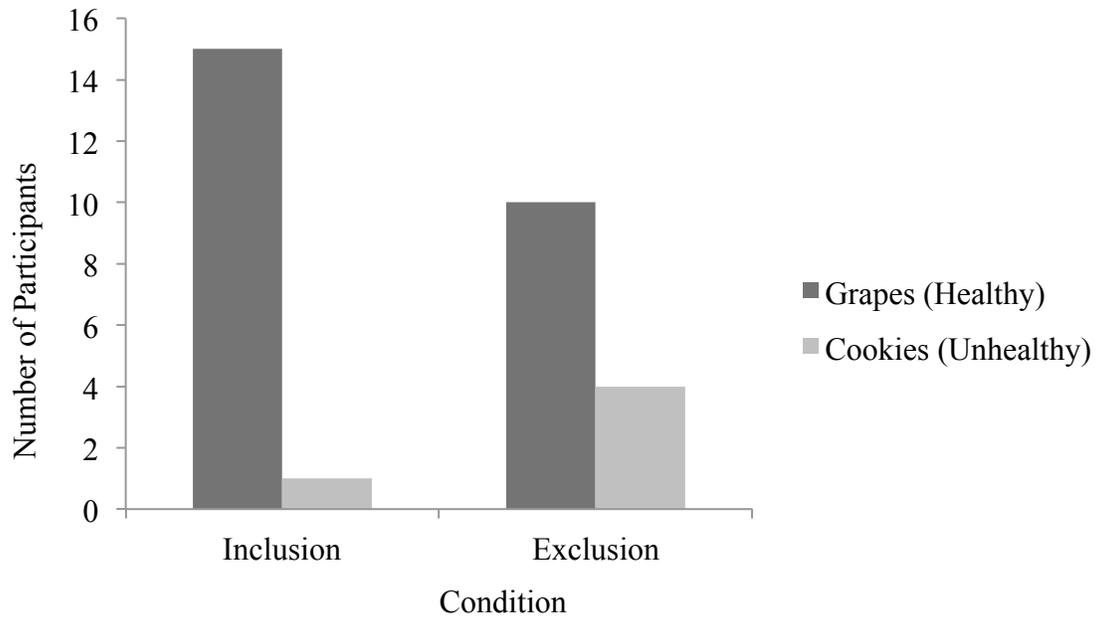
*Inclusion feeling and food consumption (in grams).*

	Inclusion Feeling	Bullying Experience	Mean	Std. Error
Grapes	Felt Included	Bullied	39.27	8.57
		Not Bullied	26.46	7.89
	Felt Excluded	Bullied	23.02	6.89
		Not Bullied	40.18	8.57
Cookies	Felt Included	Bullied	5.31	4.44
		Not Bullied	10.67	4.08
	Felt Excluded	Bullied	14.88	3.57
		Not Bullied	9.64	4.43
Total	Felt Included	Bullied	44.58	8.61
		Not Bullied	37.131	7.92
	Felt Excluded	Bullied	37.90	6.93
		Not Bullied	49.82	8.61

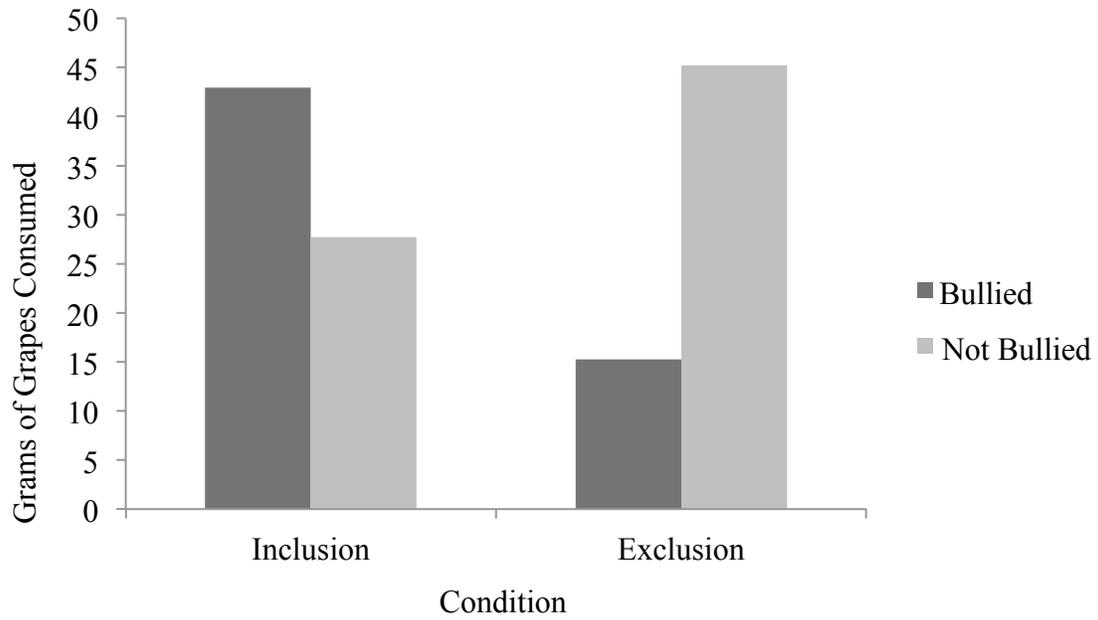
Table 2

*Food consumption (in grams) in male and female participants.*

	Mean	N	Mean	Std. Deviation
Grapes	Female	28	37.48	29.11
	Male	24	23.33	26.62
Cookies	Female	28	10.69	16.24
	Male	24	10.70	13.00
Total	Female	28	48.17	28.40
	Male	24	34.03	26.50



*Figure 1.* Study 1: number of participants who received the second set of instructions (N=30) in each condition who consumed primarily healthy and unhealthy foods.



*Figure 2.* Study 1: Grams of grapes consumed by participants who received the second set of instructions in each condition who had and had not been bullied.

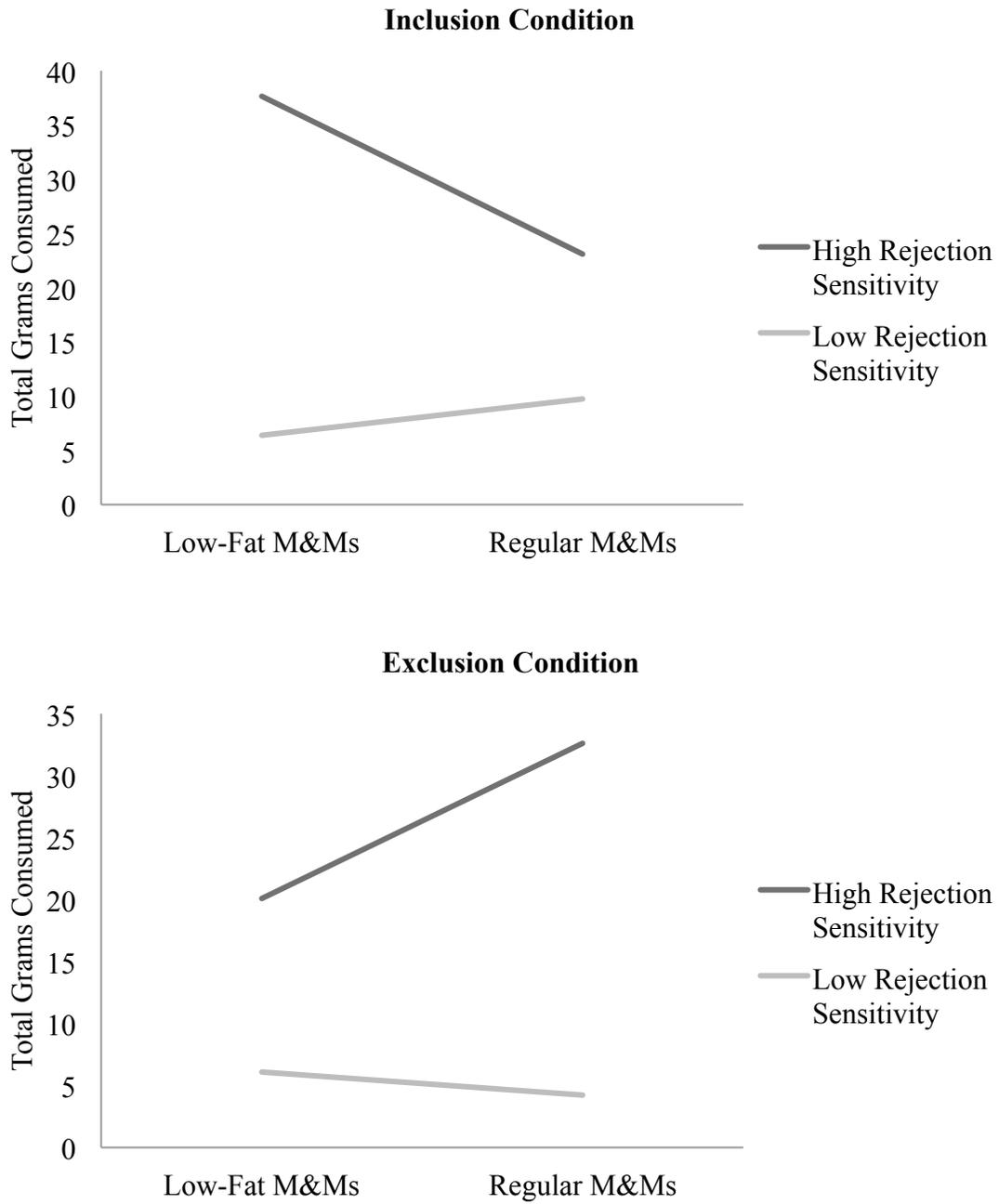


Figure 3. Study 2: Total grams of low-fat and regular M&Ms consumed by high and low RS participants in both conditions.