THE EFFECTS OF OSTRACISM ON SELF-REGULATION FOR

SOCIOTROPIC AND AUTONOMOUS INDIVIDUALS

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ABSTRACT

The present study investigated individual differences in the relation between ostracism and self-regulation. Previous research shows that being excluded leads to reduced performance on tasks that require self-regulation. Self-regulation deficits have been linked to many mental health issues, including depression.   According to the diathesis-stress theory, depression results from pre-existing vulnerabilities combined with stressful events. Two vulnerabilities to depression are the personality variables sociotropy and autonomy, characterized by high levels of interpersonal dependence and autonomy/achievement, respectively. In this study it was predicted that those high in sociotropy would show greater self-regulation deficits after experiencing ostracism, while those high in autonomy would experience a buffering effect. Participants played a game called Cyberball that includes or excludes the player. They then completed a measure of self-regulation. Results show that sociotropy moderated the relation between ostracism and cookies eaten. This suggests that individuals overly invested in interpersonal relationships react differently to ostracism.

Keywords: sociotropy, autonomy, ostracism, self-regulation, moderation

For Anna, Wally, and Cristina.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

The effects of ostracism on self-regulation for

sociotropic and autonomous individuals

Ostracism is a harmful social phenomenon that can be damaging to an individual's

mental health and well-being (Williams, 2001) and leads to deficits in self-regulation

(Baumeister, DeWall, Ciarocco, & Twenge, 2005). Individuals who are vulnerable to

psychopathology may be particularly susceptible to the experience of rejection. The aim of the

current study was to investigate the effects of ostracism on self-regulation, in particular for those

who have personality dispositions that leave them vulnerable to depression.

The pathways to depression are numerous and may vary based on differences in how

individuals react to specific negative life events. According to the *diathesis-stress model*, a

preexisting vulnerability combined with stressful life events such as loss, goal frustration, or

interpersonal problems leads to an increased risk of developing depression (e.g., Coyne &

Whiffen, 1995; Ingram & Luxton, 2005). Preexisting vulnerabilities linked to depression include

genetic history (e.g., Hammen, Bistricky, & Ingram, 2010; Perris, von Knorring, & Perris, 1982),

previous exposure to uncontrollable life events (Seligman, 1972), and habitual patterns of

cognitions based on underlying personality dimensions (e.g., Beck, 1983; Blatt, Afflitti, &

Quinlan, 1976).

The extent to which specific personality styles can increase one's vulnerability to

depression is crucial to our understanding of the etiology and prevalence of this mood disorder.

From the clinical literature, two personality constructs labelled *sociotropy* and *autonomy* have

been linked to the onset of depression (Clark & Beck, 1991). These relatively stable dimensions

correspond to particular patterns of psychological functioning. The sociotropic individual

invests highly in positive interaction with others, has a prevailing need for intimacy, support, and

nurturance, and avoids any behaviour that might lead to isolation. The autonomous personality pattern is characterized by an excessive concern for distance from others, control, and personal achievement. Although it is most common that one predominates in an individual, both may be present in equal strength (Beck, 1983).

Sociotropy/Autonomy and Vulnerability to Depression

These tendencies to invest more highly in either interpersonal or achievement realms is thought to significantly impact the reactions of sociotropic and autonomous individuals to stressful life experiences. According to the *event congruency hypothesis* (Beck, 1983; Ingram, Miranda, & Segal, 1998), a sociotropic individual would be more likely to experience a depressive episode after facing an interpersonal frustration involving losing friends, relatives, or other support and nurturance in their life, whereas an autonomous individual might develop depression in response to losses in their career or reductions in their ability to independently direct and control their lives. For example, an early study by Hammen, Ellicott, Gitlin, and Jamison (1989) followed participants over a six month period and found that onset and/or worsening of depressive symptoms was related to the congruence between their sociotropy and autonomy scores and the type of stressful life events they experienced.

Although this finding is typical (e.g., Bieling & Alden, 2001; Frewen & Dozois, 2006; Segal, Shaw, & Vella, 1989), some investigations based on the event congruency hypothesis have produced conflicting evidence. For example, one study found that for both personality types, experiencing either an interpersonal or an achievement stressor can lead to negative affect and lower self-esteem (Dasch, Cohen, Sahl, & Gunthert, 2008). Other research has found that the match between sociotropy and interpersonal stressors predicted dysphoria but the match between autonomy and achievement stressors predicted hostility (Raghavan, Le, & Berenbaum,

2002). This suggests that experiencing life stressors may relate to different types of mental health issues for those high in autonomy. This is supported in work by Clark, Beck, and Brown (1992), which found that sociotropy, but not autonomy, interacted with negative life events to predict dysphoria. Some have proposed that the contribution of autonomy can be clarified by dividing it into two subscales. The first of these two factors (*solitude*) involves a high sensitivity to others' control, whereas the second (*independence*) involves the pursuit and attainment of goals (Bieling, Beck, & Brown, 2000).

Regardless of whether an individual is dependent on stable and nurturing relationships or invests primarily in an uncompromising pursuit of personal achievement, we all must navigate the social world in order to reach our goals. Unfortunately individuals with high levels of either sociotropy or autonomy may experience significant difficulties in the realm of interpersonal interactions. Flett, Hewitt, Garshowitz, and Martin (1997) found that both personality dimensions were positively correlated with a higher frequency of negative social interactions. And we know that individuals suffering from depression are often socially rejected by their friends and acquaintances (e.g., Coyne, 1976; Gotlib & Robinson, 1982; Joiner, Alfano, & Metalsky, 1992).

Both personality types behave in ways that may undermine the investments they make in relationships and personal achievement. Sato and McCann (2007) showed that sociotropic individuals tended to be overly nurturant to non-close others yet vindictive to close others. They suggested that both behaviour patterns contribute to the initial development of interpersonal bonding but will not sustain these relationships over time. They also found that autonomous individuals acted in ways that were domineering towards non-close others and avoidant towards close others, behaviours that may be adopted by those high in autonomy to signal their goal

orientation. However, without the close interpersonal ties that often assist and support an individual's pursuit of success, those very efforts may be undermined. Therefore, the many difficulties both sociotropic and autonomous individuals experience in social interaction may contribute to their vulnerability to mental health issues.

Self-regulation and Ego Depletion

The current literature on depression suggests that deficits in self-regulation are a critical component of psychological vulnerability (Morf & Mischel, 2002). Self-regulation is a general term for a number of processes that monitor progress towards goals in relation to a changing environment (Matthews, Schwean, Campbell, Saklofske, & Mohamed, 2000). Self-regulation is a dynamic system that allows individuals to move towards goals through the use of feedback loops (Carver & Sheier, 1998). Much like a thermostat, a feedback loop includes an input function, a reference value, a comparator, and an output function. Thus, we continuously monitor our progress and compare it to an ideal state, adjusting our thoughts, emotions, and behaviours accordingly (Strauman, 2002). This ongoing process involves trade-offs between competing goals, such as between short term and long term objectives (Morf & Mischel, 2002) or between competing stimuli in the environment.

Self-regulation is thought to be comprised of four main "ingredients" (Baumeister & Vohs, 2007): standards, monitoring, motivation, and strength. Individuals' predominant standards or objectives will influence the choices they make between competing impulses. When standards are ambiguous or conflicting, self-regulation is difficult. The second component, monitoring, is an essential part of the feedback loop. Individuals self-monitor in order to assess the progress being made towards relevant goals. The third key component is motivation, or the desire to pursue relevant goals. Without this driving force, an individual is

unlikely to expend any effort on self-regulation. Finally, regulatory strength (also referred to as willpower) can be seen as an energy source that is crucial for carrying out acts of self-regulation. The strength component of self-regulation is a limited resource and repeated self-regulation efforts lead to *ego depletion* (Baumeister, Bratslavsky, Muraven, & Tice, 1998). According to the ego depletion model, after engaging in self-regulation, an individual will have a decreased capacity for regulatory behaviour on subsequent activities. An important question raised by this model of self-regulation is whether a deficit in regulatory strength represents a specific pathway through which depression might develop. This issue has seen only very limited attention to date.

Self-regulation and Depression

The association between self-regulation and a host of mental health issues such as alcoholism, compulsive behaviours, and ADHD have been well-documented (e.g., Noël, Bechara, Brevers, Verbanck, & Campanella, 2010; Shiels & Hawk, 2010; Tangney, Baumeister, & Boone, 2004). In general these examples suggest that decreased self-regulation relates to poor impulse control, rendering individuals vulnerable to excesses of unhealthy or antisocial behaviours. However, the contribution of self-regulation deficits to the development of mood disorders is not as clearly understood. Characteristic elements of depression such as dysphoria, withdrawal from usual activities, and decreased energy, suggest over-engagement of the self-regulation system used to inhibit and manage impulses.

The self-regulation system is complex and subsumes a host of lower-order processes such as self-monitoring, self-evaluation, and reward. Research on these specific mechanisms suggests that individuals with depression show a pattern of reduced self-reward and increased self-punishment (Rozensky, Kravits, & Unger, 1981). This indicates that depressed individuals lack the self-reinforcement skills necessary to attain their goals.   Similarly, Kocovski and Endler

(2000) found that individuals high in depression were low on self-evaluation, positive self-reinforcement, and the expectancy to achieve goals. Without a positive view of potential outcomes, individuals with depression are unlikely to expend self-regulation resources. In fact, both the psychological and the neurophysiological aspects of depression may be related to an unwillingness and ineffectiveness in approaching goals (Strauman, 2002). Although the present study will not examine the underlying mechanisms of self-regulation failure, it is acknowledged that they are important in the connection between self-regulation and depression.

The association between depression and self-regulation is further complicated when we consider situations in which individuals have managed to engage their promotion system and pursue a relevant goal, but are unsuccessful. Lack of success may come as a result of ineffective self-monitoring and reinforcement, or simply due to external events not related to the individual's self-regulation ability. As mentioned, sociotropic and autonomous individuals over-invest in specific goals, which exposes them to higher levels of frustration when the goal becomes inaccessible. Carver and Sheier (1998) pointed out that depression often results from the inability to mentally disengage from an unattainable goal. For a sociotropic individual this might lead to continued investment in a partner who has expressed the desire to separate. For an autonomous individual this might manifest as continued pursuit of a career path that is no longer available. These inevitable goal frustrations faced by all individuals in life will then exacerbate preexisting problems in self-regulation and further reduce the ability of sociotropic and autonomous individuals to effectively set and pursue their goals.

Self-regulation and Ostracism

Social acceptance is one of the central goals that individuals self-regulate towards, in fact it is considered to be one of three fundamental human goals (Deci & Ryan, 2000). The self-

regulation system may be uniquely designed to enable humans to create and maintain the complex social networks that are crucial to our survival (Baumeister, DeWall, Ciarocco, & Twenge, 2005). Threats to these social networks are therefore perceived as threats to the self. In the past ostracism often took the form of expulsion from the community, and meant a severing of the relational bonds that kept individuals alive (Gruter & Masters, 1986). In modern cultures ostracism may not amount to the same threat to survival, but its consequences can still be deadly. Severe and persistent cases of excluding, and/or stigmatizing others factor into the prevalence of depression and suicidal ideation in adolescents (Klomek, Marrocco, Kleinman, Schonfeld, & Gould, 2007). Throughout the lifespan individuals will face social rejection in its myriad forms, and therefore all individuals are highly vigilant for signs of rejection due to the possible detriments to personal health and safety (Gruter & Masters, 1986). Unfortunately this ready detection comes at a cost, pulling resources from other processes such as self-regulation (Oaten, Williams, Jones, & Zadro, 2008). Ostracism is therefore a life stressor that may result in a host of mental health and self-regulatory problems, perhaps especially for those individuals who show a tendency to overinvest in their social relationships.

Social exclusion can lead to deficits in self-regulation. Individuals who are told they are likely to have a lonely future or are given false negative feedback about group inclusion showed less self-regulation on health tasks (Baumeister, DeWall, Ciarocco, & Twenge, 2005). Follow-up studies revealed that these self-regulation deficits can be reversed when a cash incentive is present, suggesting that participants were not incapable of self-regulation but only lacked the motivation to do so. Individual differences in social susceptibility have been found to moderate the impact of ostracism when time is taken into consideration; those who are highly anxious regarding the potential evaluation of others experienced a longer duration of negative outcomes

after experiencing social rejection (Zadro, Boland, & Richardson, 2006). This phenomenon was also demonstrated in a study by Oaten et al. (2008), in which ostracised socially anxious individuals had lower self-regulation those low on social anxiety, again only after a time delay. Interactions have also been found with depression and self-esteem; high levels of depression or low levels of self-esteem were related to stronger feelings of rejection and lower self-ratings after being excluded from a laboratory group (Nezlek, Kowalski, Leary, Blevins, & Holgate, 1997).

An important next step for research in self-regulation, interpersonal relations, and mental health will be to examine social rejection and its impact on self-regulation for individuals with personality vulnerabilities to depression. According to Beck (1983), few individuals are more vulnerable to the negative consequences of social rejection than those high in sociotropy. To date this question has not been addressed, so it will be a new avenue in the personality and mental health area. The present thesis investigated the moderating role of sociotropy and autonomy in the relation between ostracism and self-regulation. In doing so we have attempted to synthesize previous research on vulnerability to depression and incorporate self-regulation theory into our understanding of the pathways through which certain personality traits can lead to higher frequencies of or more debilitating incidents of depression. It was predicted that for sociotropic individuals, for whom the social context is highly relevant and who are overly concerned with forming and maintaining relational bonds with others, ostracism will have an amplified negative effect on the ability to self-regulate. However, for autonomous individuals, ostracism was not expected to have the same significant impact. Robins and Block (1988) found that autonomous individuals experienced fewer depressive symptoms after negative social experiences, suggesting that autonomy serves an event-buffering role. Therefore, social rejection

was hypothesised to lead to greater levels of self-regulation and control as the tendency of these individuals is to seek distance from others and ignore social feedback (Beck, 1983).

Method

Participants

A total of 118 participants (72 female, 46 male) were recruited from the Undergraduate Research Participant Pool (URPP) at York University and completed the study for course credit in an introductory psychology course. The sample ranged in age from 17 to 57 years (M = 20.42 SD = 4.75), and the self-identified cultural backgrounds of the group included Caucasian/ European (29.1%), East Asian (20.5%), South Asian (18.8%), African/Caribbean (14.6%), Middle Eastern (8.5%), and Other (8.5%). One participant was dropped from the sample for not completing the personality questionnaire, and all subsequent analyses were conducted using N = 117 (ostracised = 59 and included = 58).

Materials

The study was a quasi-experimental design that incorporated both an experimentally manipulated variable and individual difference variables. Questionnaires were used to collect information on demographics, personality, psychopathology, and mood (See Appendices for scale items). Ostracism and inclusion were manipulated through a game called Cyberball (Williams & Jarvis, 2006). A behavioural task was used to measure the dependent variable of self-regulation.

Sociotropy-Autonomy Scale. The Sociotropy-Autonomy Scale (Clark, Steer, Beck, & Ross, 1995) is a 58-item questionnaire with subscales measuring sociotropy, solitude, and independence. Each item requires the participant to respond on a frequency scale of 1 (*never)* to 5 (*all of the time)*. Scores are calculated separately for each of the three dimensions. An

autonomy subscale can be calculated based on the combined solitude and independence scores, although solitude and independence should generally be considered separately based on their differing associations to mental health outcomes (Bieling et al., 2000). Psychometric properties of all three measures are acceptable, with high consistency (Cronbach alphas: sociotropy, .87; solitude, .70; independence, .76) and test-retest reliability (Clark et al., 1995). This measure was included to determine the degree to which participants invest in interpersonal relationships, personal achievement goals, or both. These personality dimensions were investigated as potential moderators in the relation between ostracism and self-regulation.

Beck Depression Inventory. A measure of depression was included to determine if levels of sociotropy and autonomy in the sample of participants were related to levels of the mood disorder. In addition, it was necessary to control for preexisting levels of depression when analysing the effects of a life stress on self-regulation. A revised version of Beck's original scale, the Beck Depression Inventory-II (BDI-II, Beck, Steer, Ball, & Ranieri, 1996), was used. This measure is a 21-item scale that accurately detects an individual's level of depression in the preceding 2 weeks. It has excellent internal consistency (.91) and correlates strongly with the previous version, the BDI-IA (.93). Some example items are "I am so sad or unhappy that I can't stand it", and "I feel my future is hopeless and will only get worse".

Spielberger State Trait Anxiety Inventory. Anxiety disorders are often comorbid with depression. The Spielberger State Trait Anxiety Inventory was included to account for levels of both a temporary condition of state anxiety and a more general long-standing quality of trait anxiety (STAI; Spielberger, Gorsuch, & Lushene, 1970; Spielberger, 1983). This self-report measure includes two separate 20-item questionnaires. The STAI has good psychometric properties; a meta-analysis of reported internal consistency statistics reports an average of .91 for

the state measure and .89 for the trait measure (Barnes, Harp, & Jung, 2002). Some example items are "I feel strained" and "I am presently worrying over possible misfortunes".

Fear of Negative Evaluation Scale. To account for social anxiety, a brief version of the Fear of Negative Evaluation Scale was used (Leary, 1983). The brief version contains 12 items and is highly correlated with the original scale (.96) and has a Cronbach's alpha of .90. The FNE assesses the degree to which individuals experience apprehension at the prospect of being evaluated negatively by others (Leary, 1983). Each item is responded to on a *true/false* scale with higher overall FNE scores indicating a greater fear of negative evaluation.

Ostracism/Inclusion. The Cyberball game (Williams & Jarvis, 2006) was used to manipulate a sense of ostracism or inclusion. Cyberball is a computer-simulated ball toss between three individuals: the research participant and two others. The participant is told the two others are players in separate rooms connected through the Internet, when in fact they are fictitious characters on the screen. The game begins with one of the other "players" throwing the ball to the participant. When in control of the ball, the participant uses mouse clicks to choose where to throw it next. In the ostracized condition, the participant receives the ball twice and then is excluded for the rest of the game. In the included condition, the participant receives the ball approximately one third of the time. Studies using this paradigm have found that it leads to robust ostracism effects in a number of contexts (Zadro, Williams, & Richardson, 2004).

Self-Regulatory Behaviour. Self-regulation was assessed using a paradigm in which participants were asked to taste-test cookies. This procedure has been used in other studies examining self-regulation (e.g., Baumeister et al., 2005; Oaten et al., 2008; Tice, Bratslavsky, & Baumeister, 2001). Maintaining good health requires self-regulation efforts that curb momentary impulses in order to adhere to longer term goals. Therefore overindulging on good tasting but

unhealthy foods occurs as a result of deficits in self-regulation. Individuals with depression often show an increase in disordered eating behaviours (Musante, Costanzo, & Friedman, 1998), and a meta-analysis found that negative affect in general relates to the maintenance of eating pathology (Stice, 2002). Therefore impulse control in relation to eating behaviour is a relevant self-regulation paradigm for this study, in which depression and vulnerability to depression are key variables.

For the taste test participants were seated at a table with a plate of cookies and a taste rating form and were instructed to "eat as much as you need so that you can judge the taste of the cookies" (Oaten et al., 2008). Participants were then left alone with the cookies for approximately ten minutes (Baumeister et al., 2005). The plate of cookies was weighed before and after the task and a difference score in grams (g) was calculated for each participant.

Manipulation checks. To determine the impact of the ostracism paradigm, immediately after playing the Cyberball game participants were asked to complete a postexperimental questionnaire (Williams, Govan, Croker, Tynan, Cruickshank, & Lam, 2002). They rated their agreement with the statements "I was excluded" and "I was ignored" and also estimated the percentage of times that they were in control of the ball. The survey also asked participants to rate their feelings of belonging (e.g., "I felt like an outsider"), self-esteem (e.g., "I felt liked"), meaningful existence (e.g., "I felt useful"), control (e.g., "I felt powerful"), and mood (e.g., "sad", "happy"). At the end of the study session participants were also asked to assign a grade to the other players in the Cyberball game, rating them on an 8-point scale from A+ (*Exceptional*) to F (*Failing*). A manipulation check was used for the paradigm to confirm that participants considered the cookies good tasting. Participants filled out a rating form in which they rated their agreement on a scale of 1 (*Dislike very much*) to 5 (*Like very much*).

Procedure

The 60 minute laboratory session involved three components: 1) a prescreening session to measure individual difference variables, psychopathology, and mood; 2) a manipulation stage in which subjects were randomly assigned to an included or ostracized condition and 3) a measurement stage in which self-regulation was assessed using a validated paradigm. Participants signed up through the Undergraduate Research Participant Pool (URPP), which allowed us to screen for food allergies by including a message about the cookie ingredients in the study description.

Upon arrival at the session participants were given general instructions and signed a consent form. Next they were seated at a computer and began the battery of self-report questionnaires, which included the measures listed above as well as questionnaires not related to the present study. When the surveys were complete the participants were instructed to play a computer game called Cyberball (Williams & Jarvis, 2006), which is described on the introduction screen as "the Interactive Ball-Tossing Game Used for Mental Visualization!" After completing the game participants were administered a short postexperimental questionnaire to check the strength of the ostracism manipulation and measure the degree to which fundamental needs of belonging, control, self-esteem, and meaningful existence had been threatened (Williams, 2001). This questionnaire is the current standard for Cyberball research (Williams, Cheung, & Choi, 2000).

Participants then completed the self-regulation task, a cookie taste test in which they were asked to both taste the cookies and complete a short survey that includes items regarding their habitual consumer behaviour. For this task the experimenter left the room for seven minutes to allow the participant to rate the cookies without social influence. At the end of the study the

experimenter probed for any suspicions regarding the Cyberball game or the research hypothesis. The participants were then provided a full debriefing that explained the research hypothesis, the use of deception in the initial description of the game, and the reasons behind these methods. The debriefing session also included positive statements (e.g., "Thank you very much for your participation, you did really well on the tasks") in order to mitigate any lasting deficits in mood or self-regulation due to the ostracism paradigm.

Results

Descriptive statistics

Table 1 shows the means, standard deviations, and scale alphas for the measures used. The distributions of all personality variables had satisfactory levels of normality except the trait anxiety and depression scores, which were positively skewed as is expected in a nonclinical population. The dependent measure of cookies eaten was highly positively skewed. This variable was measured in grams and ranged from 1 - 98, ($M = 24.04$, $SD = 20.37$) and the Shapiro-Wilk statistic was .79, $p < .001$. To correct for the nonnormality, a natural log transformation was performed and all subsequent analyses were conducted on a new variable entitled Log cookies eaten.

Manipulation checks

Manipulation checks indicated that participants did feel either ostracised or included based on the Cyberball game they played. Those who had played in the ostracism condition were more likely to agree with the statements "I was ignored" and "I was excluded." Both differences were significant: $F(1, 114.07) = 151.57$, $p < .001$, $\eta^2 = .57$ for the first item and $F(1, 112.17) = 180.48$, $p < .001$, $\eta^2 = .61$ for the second item. In addition, analyses on the postexperimental questionnaire for feelings of self-esteem, control, meaningful existence, and

belonging show differences between the conditions. Participants who played in the ostracism condition showed significantly lower levels of all four measures: self-esteem, F(1, 111.77) = 65.60, *p* < .001, η² = .37, control, F(1, 105.29) = 81.02, *p* < .001, η² = .41, meaningful existence, F(1, 110.13) = 74.53, *p*<.001, η² = .40, and belonging, F(1, 114.87) = 130.23, *p* < .001, η² = .53. The grades given to the two other purported Cyberball players differed significantly between conditions. Included participants gave on average a 3.02 (a "B+" grade) and ostracised participants gave on average at 5.32 (a "C+" grade), and this difference was significant: *t*(99.69) = -7.50, *p* < .001. On average, included participants were evaluating the other players two grades higher than the excluded participants.

The consumption of a flavourful but unhealthy food is generally considered a behaviour that should be limited (Tice et al., 2001). To confirm that the participants regarded the cookies for the taste test as such, they were asked to respond to four items regarding their opinion of the cookies, which were then averaged to create a taste rating variable. The average rating of the cookies was only slightly higher than the midpoint of the scale, M = 3.23, SD = .87. The ratings showed some variability based on whether the participant had been ostracised or included. The taste rating for the included group was M = 3.37, SD = .76 and for the ostracised group, M = 3.08, SD = .94. A test on the difference between these means showed a slight difference: *t(111.08)* = 1.81, *p* = .073. This difference has a small to medium effect size (Cohen's D = .34), therefore although not statistically significant in a two-tailed test, it is a difference to be concerned with in conducting further analyses. In our regression analyses we included the taste rating variable in order to control for this discrepancy.

Correlational Analyses

Table 1 shows the results of the bivariate correlation analyses for the depression, anxiety, social anxiety, and sociotropy/autonomy variables with the log transformed outcome variable. Cookies eaten was negatively correlated with state anxiety, indicating that those higher in anxiety ate fewer cookies. None of the other personality or psychopathology measures correlated with cookies eaten. As expected based on previous research, depression was positively correlated with anxiety, sociotropy, and the solitude subscale of autonomy. In addition, sociotropy was positively related to trait anxiety and to solitude. Also predicted by previous work, the facet of independence was negatively correlated with the measures of trait anxiety, social anxiety, and depression, although the latter did not reach statistical significance.

Regression Analyses

Regression models were designed to examine the moderating effects of the personality variables when controlling for sex, taste rating, and our psychopathology measures (depression, trait anxiety, and social anxiety). These measures were used as covariates in order to examine the impact of personality vulnerability on self-regulation when current levels of psychopathology are held constant. Social anxiety did not reach significance as a predictor in any of the models and was excluded from the subsequent analyses.

The first regression analysis tested for a moderating effect of sociotropy on the relation between ostracism (coded so that $0 = $ *Included* and $1 = $ *Excluded*) and self-regulation. Table 2 shows the results of that analysis. In the regression we controlled for sex differences in cookie eating and variability in taste rating as well as preexisting levels of depression and anxiety. This combination of predictors accounted for approximately 29% ($R^2 = .29$, $F(7, 109) = 6.41$, $p < .001$ of the variance in cookies eaten. Neither ostracism nor sociotropy on its own was a significant

predictor of cookies eaten, but there was a significant Sociotropy X Ostracism interaction on the amount of cookies eaten ($\beta = -.015$, $p = .048$). However, this association was not in the direction predicted by our hypothesis. Instead, the interaction showed that individuals high on sociotropy ate more cookies when they had been included in the Cyberball game, and fewer cookies when they had been ostracised (see Figure 1). In this regression model depression was also a significant predictor of cookies eaten, with higher depression scores related to more cookies eaten ($\beta = .021$, $p = .026$).

To test the secondary hypothesis that autonomy may function as a protective factor against self-regulation deficits after an incident of ostracism, regression analyses were conducted on autonomy as well as its two subscales of independence and solitude. No significant effects were found for these personality dimensions.

Exploratory Analyses

An additional regression analysis was conducted to investigate a potential interaction between depression and sociotropy. Similar to the main regression model, this combination of predictors accounted for approximately 30% of the variance in cookies eaten ($R^2 = .30$, $F(6, 109) = 6.553$, $p < .001$). As in the previous analyses, the variables of taste rating, sex, depression, and state anxiety were controlled for. Depression was a significant predictor of cookies eaten, with higher depression leading to more cookies eaten ($\beta = .122$, $p = .012$). In addition, there was a significant Depression X Sociotropy interaction ($\beta = -.001$, $p = .031$). The results of this regression are shown in Table 3 and the interaction is graphed in Figure 2. The graph shows that for individuals high in sociotropy, variance in depression scores does not relate to grams of cookies eaten. However, for those with low levels of sociotropy, higher depression is associated with more cookies eaten.

Finally, regression analyses were also conducted using the eight manipulation checks as the outcome variables and the interaction between ostracism and either sociotropy, autonomy, or depression as the predictors. A significant interaction between ostracism and sociotropy was found only for the meaningful existence scale. The results of this analysis are displayed in Table 4. Alone, neither ostracism nor sociotropy were significant predictors of reported feelings of meaningful existence, but the interaction between the two variables was a predictor (β = -.023, p = .019). This interaction is graphed in Figure 3, illustrating that for those individuals high in sociotropy, ostracism led to a greater reduction in their sense of meaningful existence.

Discussion

In this study it was found that the personality dimension of sociotropy was related to distinct responses to social rejection. After playing a game in which they were excluded by other players, those with high sociotropy ate fewer cookies than those with low scores on this personality variable. The results suggest that sociotropy played a moderating role in the relation between ostracism and self-regulation. This relates to previous research showing that individuals with depression had an amplified reaction to social rejection (Nezlek et al., 1997), as well as research showing that dysphoric individuals rate negative life events as more upsetting than nondysphoric individuals (Clark et al., 1992). To integrate findings across different areas it is necessary to look more closely at the reciprocal interactions between the internal and external factors that elicit, maintain, and exacerbate mental health disorders.

Past research has shown that social exclusion can lead to deficits in self-regulation as manifested in an increased consumption of less healthy foods. In this study while we did not find an effect for social exclusion alone, we did find an effect for social exclusion and sociotropy together. Our most vulnerable participants, those with high scores on our sociotropy measure,

consumed fewer cookies than less vulnerable individuals. We expected to find just the opposite. One possibility is that for our most vulnerable participants, social exclusion is so common an experience that it no longer serves to deplete their self-regulation resources; it is not a surprise to them therefore they don't ruminate on it or try to explain it away. This is consistent with the literature showing that depressed individuals possess fewer social skills and that as a result they often act in ways that lead their friends and acquaintances to abandon them (e.g., Gotlib and Robinson, 1982).

A second possible reason for the unexpected results may be that the self-regulation measure did not perform in the same fashion that it had in other research on this topic. Use of this paradigm has always rested on the supposition that consumption of an unhealthy but good tasting food is to be avoided, so those higher in self-regulation will abstain from eating many cookies and those low in self-regulation will indulge. In our study however, the cookies were not rated as particularly tasty or desirable. The mean rating was only slightly above the midpoint of the scale (labelled "Neither like nor dislike"). Individuals who were ostracised rated the cookies slightly less favourably than the included participants. The results of these manipulation checks suggest that it might have felt like an imposition for those individuals to eat the cookies and respond to questions about them. In fact past studies have shown that self-regulation can also be measured by how much of a healthy, unpleasant tasting beverage the participants will drink (Muraven & Slessareva, 2003; Oaten et al., 2008). Those that drank more were considered to have higher self-regulation. If the cookies were perceived as a healthy and unpleasant tasting snack, lower consumption may be related to lower self-regulation. This indicates that different measures are needed, and a different index of self-regulation depletion.

Despite the surprising direction of the results, these data indicate a need to look closely at sociotropic individuals and their reactions to interpersonal stressors. Previous studies have found that sociotropy is related to high reactivity to daily stress, specifically regarding sociotropic individuals' self-perceptions (Dasch et al., 2008), and that these individuals report higher numbers of negative social interactions (Flett et al., 1997). This presents the possibility for an additive effect, in which the impact of negative interactions builds up very quickly for those high in sociotropy. In the specific case of ostracism, sociotropic individuals may tend to evoke social rejection because of their anxious need for support (Rude & Burnham, 1995) and their calculating, vindictive behaviour towards close others (Sato & McCann, 2007). We would expect that after rejection has occurred they experience loss and frustration to an elevated degree. But, as was suggested earlier, perhaps rejection is so routine that one more incident does not lead to excessive rumination and self-regulatory processing. This possibility should be examined in future research.

The secondary hypothesis stated that autonomous individuals would also respond in a unique manner to ostracism because they tend to ignore social feedback and seek distance from others. Therefore exclusion might lead them to maintain or show improved self-regulation as opposed to sociotropic individuals who experience self-regulation deficits. Our data did not support this possible buffering effect; autonomy did not play a moderating role in the relation between ostracism and self-regulation. This introduces the possibility that those high in autonomy react to ostracism in the same way as those low in autonomy.

Overall, the results of this project have left several unanswered questions regarding the relation between autonomy and self-regulation. It may be that those high in autonomy do not commonly experience deficits in self-regulation, or that they experience deficits only when

achievement related stressors occur. To explore the hypotheses suggested by the event congruency hypothesis, it would be necessary to study the effects of an achievement related stressor on self-regulation for both sociotropic and autonomous individuals. However, it is common that autonomy does not produce expected results in this area of research, suggesting that the way it is operationalized and/or measured is problematic. For example, in their meta-analysis, Nietzel and Harris (1990) reported that achievement/autonomous needs do not have reliable associations with depression. They also observe that studies using college student samples are less likely to find support for the event congruency hypothesis with regards to autonomous individuals, a restriction that impacts the current study as well.

In addition to the primary objective of this research, a number of supplementary exploratory analyses were conducted to further examine the effects of personality and psychopathology when an interpersonal stressor has been experienced. The first was a regression conducted to determine if an interaction exists between sociotropy and depression. A significant interaction was found, indicating that for individuals low in sociotropy, higher depression related to more cookies eaten. At high levels of sociotropy depression was no longer associated with variance in cookies eaten.

This is the first time that these two variables have been considered together in terms of their implication for self-regulation, therefore a number of interpretations are possible. If cookies eaten are regarded as an index of self-regulation, this interaction signifies that individuals who are low in sociotropy but high in depression symptoms experience self-regulation deficits after an incident of ostracism. However, previously in this paper we suggested that the cookie taste test may not have functioned in the expected manner, so this interpretation remains tentative. Nevertheless, individuals with a vulnerability to depression

reacted differently to ostracism than those currently suffering from depression, posing interesting questions regarding what differences there are between those with this personality trait and the mood disorder to which they are susceptible. It may be that beyond a certain threshold of personality vulnerability, dysphoric feelings have no additional contribution to make regarding reactions to ostracism.

Finally, all of the manipulation checks were also explored for any potential moderating effects of sociotropy, autonomy, or depression. A significant result was found that revealed an interaction between ostracism and sociotropy on perceptions of meaningful existence. This showed us that those with sociotropy experienced a greater decrease in feelings of meaningful existence when they were ostracised. It is interesting that sociotropic individuals differed only on that specific variable. It suggests that individuals who overinvest in having strong nurturing social ties may also consider their identity to be inextricably linked to these relationships. After experiencing loss, rejection, or alienation from others, sociotropic individuals are more likely to feel useless, invisible, and nonexistent. This is an important finding for research into personality vulnerability to depression. While the ostracism manipulation did seem to produce effects in line with past work leading to dejection, at least for those high in sociotropy, it did not affect our self-regulation index as expected. Perhaps this is another indication that our self-regulation measure was flawed.

Limitations

The current study was limited by a variety of factors. One is that the sample used was exclusively composed of students in a first year course at a Canadian university, narrowing the possibility for external validity. Ostracism is a social phenomenon that must be considered within its social and cultural context. Although our sample is culturally diverse, it is

nevertheless situated within a Western context and may have characteristics not specifically revealed by the research parameters. In addition, as all the participants were university students, it is necessary to consider the possibility that individuals who choose a postsecondary education differ in one or more variables relevant to the current study. It is important to note, however, that for research on mental health issues, a university sample is particularly appropriate. Due to the academic, social, and financial pressures facing postsecondary students, this demographic has a high prevalence of depression, anxiety, and suicidality (Eisenberg, Gollust, Golberstein, & Hefner, 2007). Although still distinct from a clinical sample, these youth can provide important insights for research into mental health and well-being.

The scope of the current research project did not include measures of the mechanisms of self-regulation. As described earlier, this multifaceted system requires a number of elements to function well (e.g., standards, monitoring, strength, and motivation) and generally encompasses many secondary processes such as self-evaluation and reward. Without investigating these individual elements specifically, it is unclear how personality vulnerability might relate to self-regulation deficits. It may be that vulnerable individuals are unmotivated to establish and pursue meaningful goals, or that they do not engage in appropriate self-monitoring and evaluation in order to reach their goals. As suggested by the theories of Beck (1983) and Carver and Sheier (1998), the main difficulty may be that vulnerable individuals are unable to accept losses and disengage from unattainable goals. Self-regulation requires appropriate responses to a changing environment (Matthews et al., 2000); perhaps sociotropic individuals do not adjust their thoughts, beliefs, and behaviours accordingly.

A methodological limitation of this project is that self-regulation was only measured at one time point, following a single incident of ostracism. To properly relate the experience of life

stressors such as social rejection to incidences of mental health disorders it is likely important to study the accumulation of a number of negative experiences over the life course. Prospective longitudinal research has helped to clarify the pathway to mental health deficits such as the ways in which individual's reactions to life stress along with genetic vulnerability can lead to depression (Caspi et al., 2003) as well as the possibility that personality vulnerability relates to higher numbers of negative life events (Nelson, Hammen, Daley, Burge, & Davila, 2001). Thus, other longitudinal designs or even qualitative methods may more accurately explicate the complicated associations between ostracism, personality, self-regulation, and depression.

Future directions

I would like to conduct a series of follow up studies in order to account for some of the limitations or ambiguous findings in the current project. First a replication study using a different, more universally well-liked food in the taste test may lead to a different pattern of results. Additional studies that utilise a wider range of self-regulation tasks will begin to uncover the specific components of self-regulation that are affected by social rejection, and studies that include longitudinal methods such as a diary design will help to show the reciprocal interactions of the key variables. Given the high rates of depression and other mental health disorders, this topic is an important one and should be studied as thoroughly as possible.

Table 1

Psychometric Properties and Intercorrelations of Measures in the Total Sample

	1	2	3	4	5	6	7	8
1. Cookies eaten	--							
2. Depression	.02	--						
3. Trait Anxiety	-.22*	.53**	--					
4. Social Anxiety	-.15	.56**	.54**	--				
5. Sociotropy	-.11	.53**	.50**	.70**	--			
6. Autonomy	.10	.09	-.10	.01	.10	--		
7. Solitude	.15	.30**	.21*	.31**	.36**	.69**	--	
8. Independence	.01	-.13	-.31**	-.24*	-.17	.80**	.11	--
M	24.04	31.00	38.16	33.58	90.31	99.69	32.64	67.05
SD	20.37	7.91	11.84	10.30	17.80	10.71	6.48	7.82
Alpha	n/a	.86	.93	.91	.90	.69	.69	.68

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

Table 2

Predictors of Log Cookies Eaten: The Interaction Between Sociotropy and Ostracism

Predictor	B	95% CI	p-value	Semi-Partial r²
Taste rating	.354	[.20, .51]	.000	.126
Sex	-.534	[-.81, -.26]	.000	.095
Depression	.021	[.00, .04]	.048	.026
Trait Anxiety	-.011	[-.03, .00]	.118	.016
Sociotropy	.005	[-.01, .02]	.382	.005
Ostracism	1.180	[-.17, 2.53]	.087	.019
Sociotropy X Ostracism	-.015	[-.03, .00]	.048	.026

Note: CI = Confidence Interval

Table 3

Predictors of Log Cookies Eaten: The Interaction between Sociotropy and Depression

Predictor	B	95% CI	p-value	Semi-Partial r^2
Taste rating	.349	[.19, .51]	.000	.122
Sex	-.505	[-.78, -.23]	.000	.086
Depression	.122	[.03, .22]	.012	.042
Trait Anxiety	-.011	[-.03, .00]	.112	.017
Sociotropy	.029	[-.00, .06]	.054	.024
Ostracism	-.159	[-.42, .10]	.234	.009
Sociotropy X Depression	-.001	[-.00, .00]	.031	.031

Note: CI = Confidence Interval

Table 4

Predictors of Meaningful Existence: The Interaction between Sociotropy and Ostracism

Predictor	B	95% CI	p-value	Semi-Partial r^2
Ostracism	.707	[-1.09, 2.51]	.437	.003
Sociotropy	-.005	[-.02, .01]	.418	.003
Sociotropy X Ostracism	-.023	[-.04, -.00]	.019	.027

Note: CI = Confidence Interval

Figure 1

Interaction Between Sociotropy and Ostracism on Log Cookies Eaten
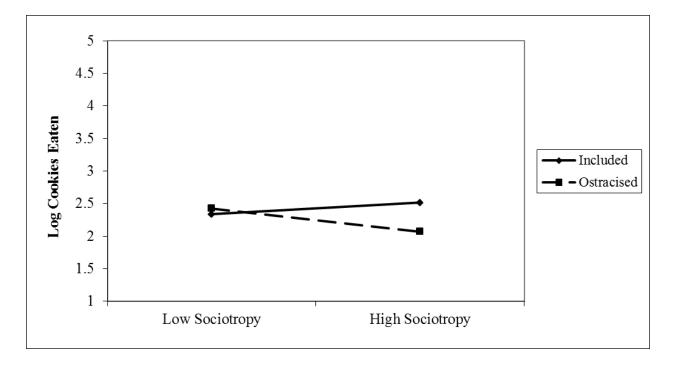
Figure 2

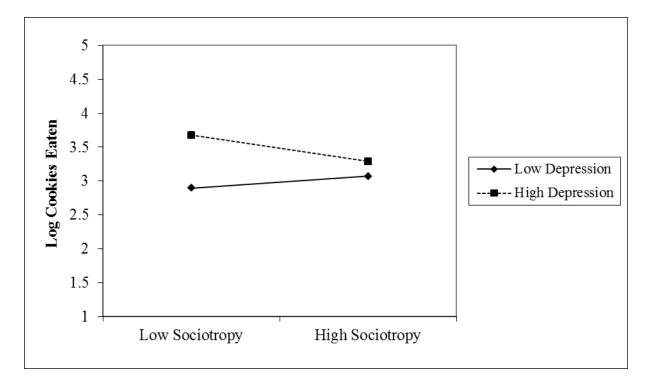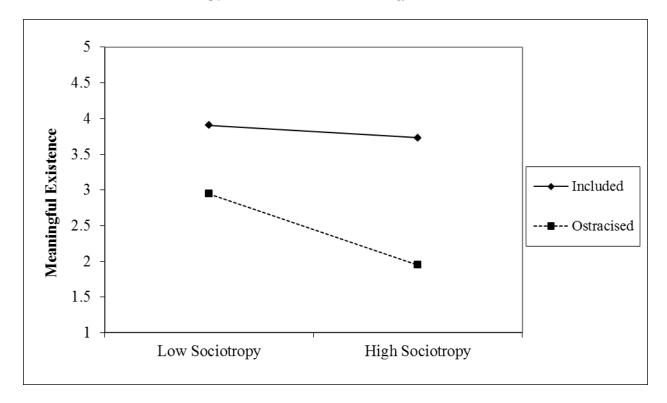*Interaction Between Sociotropy and Depression on Log Cookies Eaten*

Figure 3

Interaction Between Sociotropy and Ostracism on Meaningful Existence

References

Barnes, L.B.L., Harp, D., & Jung, W.S. (2002). Reliability generalization of scores on the Spielberger State–Trait Anxiety Inventory. *Educational and Psychological Measurement, 62*(4), 603–618.

Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology, 74*(5), 1252-1265.

Baumeister, R. F., DeWall, C. N., Ciarocco, N. J., & Twenge, J. M. (2005). Social exclusion impairs self-regulation. *Journal of Personality and Social Psychology, 88*(4), 589-604.

Baumeister, R. F., & Vohs, K. D. (2007). Self-regulation, ego depletion, and motivation. *Social and Personality Psychology Compass, 1*(1), 115-128.

Baumeister, R. F., Vohs, K. D., & Tice, D. M. (2007). The strength model of self-control. *Current Directions in Psychological Science, 16*(6), 351-355.

Beck, A.T. (1983). Cognitive therapy of depression: New perspectives. In P.J. Clayton & J.E. Barrett (Eds.), *Treatment of depression: Old controversies and new approaches* (265-290). New York: Raven Press.

Beck, A. T., Epstein, N., & Harrison, R. (1983). Cognitions, attitudes, and personality dimensions in depression. *British Journal of Cognitive Psychotherapy, 1*(1), 1-16.

Beck, A. T., Steer, R. T., Ball, R., & Ranieri, W. F. (1996). Comparison of Beck Depression Inventories-IA and –II in psychiatric outpatients. *Journal of Personality Assessment, 67,* 588-597.

Bieling, P. J., & Alden, L. E. (2001). Sociotropy, autonomy, and the interpersonal model of depression: An integration. *Cognitive Therapy and Research, 25*(2), 167-184.

Bieling, P. J., Beck, A. T., & Brown, G. K. (2000). The Sociotropy–Autonomy scale: Structure

and implications. *Cognitive Therapy and Research, 24*(6), 763-780.

Blatt, S. J., D'Afflitti, J. P., & Quinlan, D. M. (1976). Experiences of depression in normal young

adults. *Journal of Abnormal Psychology, 85*(4), 383-389.

Carver, C.S., & Sheier, M.F. (1998). *On the self-regulation of behavior*. New York: Cambridge

University Press.

Caspi, A., Sugden, K., Moffitt, T. E., Taylor, A., Craig, I. W., Harrington, H., McClay, J., Mill,

J., Martin, J., Braithwaite, A., Poulton, R. (2003). Influence of life stress on depression:

Moderation by a polymorphism in the 5-HTT gene. *Science, 301*, 386-389.

Ciarocco, N. J., Sommer, K. L., & Baumeister, R. F. (2001). Ostracism and ego depletion: The

strains of silence. *Personality and Social Psychology Bulletin, 27*(9), 1156-1163.

Clark, D.A., & Beck, A.T. (1991). Personality factors in dysphoria: A psychometric refinement

of Beck's sociotropy-autonomy scale. *Journal of Psychopathology and Behavioral

Assessment*, *13*(4), 369-388.

Clark, D. A., Beck, A.T., & Brown, G. K. (1992). Sociotropy, autonomy, and life event

perceptions in dysphoric and nondysphoric individuals. *Cognitive Therapy and Research,

16*(6), 635-652.

Clark, D. A., Steer, R. A., Beck, A. T., & Ross, L. (1995). Psychometric characteristics of

revised sociotropy and autonomy scales in college students. *Behaviour Research and

Therapy, 33*(3), 325-334.

Coyne, J. C. (1976). Toward an interactional description of depression. *Psychiatry: Journal for

the Study of Interpersonal Processes, 39*(1), 28-40.

Coyne, J.C., & Whiffen, V.E. (1995). Issues in personality as diathesis for depression: the case

of sociotropy-dependency and autonomy-self-criticism. *Psychological Bulletin, 118*, 358-

378.

Dasch, K. B., Cohen, L. H., Sahl, J. C., & Gunthert, K. C. (2008). Moderating effects of

sociotropy and autonomy on affective and self-esteem reactivity to daily stressors.

Cognitive Therapy and Research, 32(2), 177-195.

Deci, E.L. & Ryan, R.M. (2000). The "what" and "why" of goal pursuits: Human needs and the

self-determination of behavior. Psychological Inquiry, 11(4), 227-268.

Eisenberg, D., Gollust, S. E., Golberstein, E., & Hefner, J. L. (2007). Prevalence and correlates

of depression, anxiety, and suicidality among university students. *American Journal of

Orthopsychiatry*, *77*(4), 534-542.

Flett, G. L., Hewitt, P. L., Garshowitz, M., & Martin, T. R. (1997). Personality, negative social

interactions, and depressive symptoms. *Canadian Journal of Behavioural Science/Revue

Canadienne Des Sciences Du Comportement, 29*(1), 28-37.

Frewen, P. A., & Dozois, D. J. A. (2006). Self-worth appraisal of life events and beck's

congruency model of depression vulnerability. *Journal of Cognitive Psychotherapy,

20*(2), 231-240.

Gotlib, I. H., & Robinson, L. A. (1982). Responses to depressed individuals: Discrepancies

between self-report and observer-rated behavior. *Journal of Abnormal Psychology, 91*(4),

231-240.

Gray, J. A. (1981). A critique of Eysenck's theory of personality. In H. J. Eysenck (Ed.), *A model

for personality* (pp. 246-276). Berlin: Springer-Verlag.

Gruter, M., & Masters, R. D. (1986). Ostracism as a social and biological phenomenon: An

introduction. *Ethology and Sociobiology*, 7, 149–158.

Hammen, C. L., Bistricky, S. L., & Ingram, R. E. (2010). Vulnerability to depression in adulthood. In R.E. Ingram & J.M Price (Eds.), *Vulnerability to psychopathology: Risk across the lifespan, 2nd Ed.* (pp. 248-281). New York, NY: Guilford Press.

Hammen, C.L., Ellicott, A., Gitlin, M., & Jamison, K. R. (1989). Sociotropy/autonomy and vulnerability to specific life events in patients with unipolar depression and bipolar disorders. *Journal of Abnormal Psychology, 98*(2), 154-160.

Ingram, R. E., Miranda, J., & Segal, Z.V. (Eds.). (1998). *Cognitive vulnerability to depression*. New York, NY: Guilford Press.

Ingram, R. E. & Luxton, D. D. (2005). "Vulnerability-Stress Models." In B.L. Hankin & J. R. Z. Abela (Eds.), *Development of Psychopathology: A vulnerability stress perspective* (pp. 32-46). Thousand Oaks, CA: Sage Publications Inc.

Johnson, S.L., Turner, R.J, Iwata, N. (2003). BIS/BAS levels and psychiatric disorder: An epidemiological study. *Journal of Psychopathology and Behavioral Assessment, 25*(1), 25-36.

Joiner, T. E., Alfano, M. S., & Metalsky, G. I. (1992). When depression breeds contempt: Reassurance seeking, selfesteem, and rejection of depressed college students by their roommates. *Journal of Abnormal Psychology, 101*, 165-173.

Klomek, A.B., Marrocco, F., Kleinman, M., Schonfeld, I.S., & Gould, M.S. (2007). Bullying, depression, and suicidality in adolescents. *Journal of the American Academy of Child and Adolescent Psychology*, 46(1), 40-50.

Kocovski, N. L., & Endler, N. S. (2000). Self-regulation: Social anxiety and depression. *Journal of Applied Biobehavioral Research, 5*(1), 80-91.

Leary, M. R. (1983). A brief version of the fear of negative evaluation scale. *Personality and Social Psychology Bulletin, 9*(3), 371-375.

Matthews, G., Schwean, V.L., Campbell, S.E., Saklofske, D.H., & Mohamed, A.R. (2000). Personality, self-regulation, and adaptation: A cognitive-social framework. In M. Boekaerts, P. R. Pintrich, & M. Zeidner, (Eds.), *Handbook of self-regulation* (171-207). San Diego: Academic Press.

Morf, C. C., & Mischel, W. (2002). Epilogue: Self-regulation, vulnerability, and implications for mental health. *Self and Identity, 1*(2), 191-199.

Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin, 126*(2), 247-259.

Muraven, M., & Slessareva, E. (2003). Mechanisms of self-control failure: Motivation and limited resources. *Personality and Social Psychology Bulletin, 29*(7), 894-906.

Musante, G. J., Costanzo, P. R., & Friedman, K. E. (1998). The comorbidity of depression and eating dysregulation processes in a diet-seeking obese population: A matter of gender specificity. International Journal of Eating Disorders, 23(1), 65-75.

Nelson, D. R., Hammen, C., Daley, S. E., Burge, D, & Davila, J. (2001). Sociotropic and autonomous personality styles: Contributions to chronic life stress. *Cognitive Therapy and Research, 25*(1), 61-76.

Nezlek, J.B., Kowalski, R.M., Leary, M.R., Blevins, T., & Holgate, S. (1997). Personality moderators of reactions to interpersonal rejection: Depression and trait self-esteem. *Personality and Social Psychology Bulletin*, *23*(12), 1235-1244.

Nietzel, M. T., & Harris, M. J. (1990). Relationship of dependency and achievement/autonomy to depression. *Clinical Psychology Review, 10*(3), 279-297.

Noël, X., Bechara, A., Brevers, D., Verbanck, P., & Campanella, S. (2010). Alcoholism and the
loss of willpower: A neurocognitive perspective. *Journal of Psychophysiology, 24*(4),
240-248.

Oaten, M., Williams, K. D., Jones, A., & Zadro, L. (2008). The effects of ostracism on self-
regulation in the socially anxious. *Journal of Social and Clinical Psychology, 27*(5), 471-
504.

Perris, H., von Knorring, L., & Perris, C. (1982). Genetic vulnerability for depression and life
events. *Neuropsychobiology, 8*(5), 241-247.

Raghavan, C., Le, H., & Berenbaum, H. (2002). Predicting dysphoria and hostility using the
diathesis-stress model of sociotropy and autonomy in a contextualized stress setting.
Cognitive Therapy and Research, 26(2), 231-244.

Robins, C. J., & Block, P. (1988). Personal vulnerability, life events, and depressive symptoms:
A test of a specific interactional model. *Journal of Personality and Social Psychology*,
54(5), 847.

Rozensky, R., Kravits, S., Unger, R. (1981). Learned helplessness and the self-control model of
depression. *Psychological Reports, 48*, 987-994.

Rude, S. S., & Burnham, B. L. (1995). Connectedness and neediness: Factors of the DEQ and
SAS dependency scales. *Cognitive Therapy and Research*, *19*(3), 323-340.

Sato, T., & McCann, D. (2007). Sociotropy-autonomy and interpersonal problems. *Depression
and Anxiety, 24*(3), 153-162.

Segal, Z. V., Shaw, B. F., & Vella, D. D. (1989). Life stress and depression: A test of the
congruency hypothesis for life event content and depressive subtype. *Canadian Journal*

of Behavioural Science/Revue Canadienne Des Sciences Du Comportement, 21(4), 389-400.

Seligman, M. (1972). Learned helplessness. *Annual Review of Medicine, 23*, 407-412.

Shiels, K., & Hawk, L.W. (2010). Self-regulation in ADHD: The role of error processing. *Clinical Psychology Review, 30*(8): 951-961.

Spielberger, C.D. (1983). *Manual for the State–Trait Anxiety Inventory: STAI (Form Y).* Palo Alto, CA: Consulting Psychologists Press.

Spielberger, C.D., Gorsuch, R.L., & Lushene, R.E. (1970). *STAI: Manual for the State–Trait Anxiety Inventory (STAI).* Palo Alto, CA: Consulting Psychologists Press.

Strauman, T. J. (2002). Self-regulation and depression. *Self and Identity, 1*(2), 151-157.

Stice, E. (2002). Risk and maintenance factors for eating pathology: A meta-analytic review. Psychological Bulletin, 128(5), 825-848.

Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality, 72*(2), 271-322.

Tice, D. M., Bratslavsky, E., & Baumeister, R. F. (2001). Emotional distress regulation takes precedence over impulse control: If you feel bad, do it! *Journal of Personality and Social Psychology, 80*(1), 53-67.

Williams, K. D. (2001). *Ostracism: The power of silence*. New York: Guilford Press.

Williams, K. D., Cheung, C. K., & Choi, W. (2000). Cyberostracism: effects of being ignored over the Internet. *Journal of personality and social psychology*, *79*(5), 748.

Williams, K. D., Govan, C. L., Croker, V., Tynan, D., Cruickshank, M., & Lam, A. (2002). Investigations into differences between social- and cyberostracism. *Group Dynamics: Theory, Research, and Practice, 6*(1), 65-77.

Williams, K. D., & Jarvis, B. (2006). Cyberball: A program for use in research on interpersonal ostracism and acceptance. *Behavior Research Methods, 38*(1), 174-180.

Zadro, L., Boland, C., & Richardson, R. (2006). How long does it last? The persistence of the effects of ostracism in the socially anxious. *Journal of Experimental Social Psychology, 42*(5), 692-697.

Zadro, L., Williams, K. D., & Richardson, R. (2004). How low can you go? Ostracism by a computer is sufficient to lower self-reported levels of belonging, control, self-esteem, and meaningful existence. *Journal of Experimental Social Psychology, 40*(4), 560-567.

Appendix A: Sociotropy/Autonomy Scale

Please indicate what percentage of the time each of the statements below applies to you by using the scale to the right of the items. Choose the percentage that comes closest to how often the item describes you. Mark your answer in the bubbles below.

	0%	25%	50%	75%	100%
I would be uncomfortable dining out in a restaurant by myself.	O	O	O	O	O
I get uncomfortable when I am not sure how I am expected to behave in the presence of other people.	O	O	O	O	O
I focus almost exclusively on the positive outcomes of my decisions.	O	O	O	O	O
It is important to be liked and approved of by others.	O	O	O	O	O
I feel more comfortable helping others than receiving help.	O	O	O	O	O
I am very uncomfortable when a close friend or family member decides to "pour their heart out" to me.	O	O	O	O	O
I am reluctant to ask for help when working on a difficult and puzzling task.	O	O	O	O	O
When I am with other people, I look for signs whether or not they like being with me.	O	O	O	O	O
When visiting people, I get fidgety when sitting around talking and would rather get up and do something.	O	O	O	O	O
I am more concerned that people like me than I am about making important achievements.	O	O	O	O	O
I am afraid of hurting other people's feelings.	O	O	O	O	O
People rarely come to me with their personal problems.	O	O	O	O	O
I sometimes unintentionally hurt the people I love the most by what I say.	O	O	O	O	O
I feel bad if I do not have some social plans for the weekend.	O	O	O	O	O
I tend to be direct with people and say what I think.	O	O	O	O	O
People dwell too much on their personal problems.	O	O	O	O	O

Once I've arrived at a decision, I rarely change my mind.	O	O	O	O	O
Being able to share experiences with other people makes them much more enjoyable for me.	O	O	O	O	O
I do things that are not in my best interest in order to please others.	O	O	O	O	O
I prefer to "work out" my personal problems by myself.	O	O	O	O	O
When I have a problem, I like to go off on my own and think it through rather than being influenced by others.	O	O	O	O	O
I find it hard to pay attention to a long conversation, even with friends.	O	O	O	O	O
I get lonely when I am home by myself at night.	O	O	O	O	O
The worst part about growing old is being left alone.	O	O	O	O	O
Having close bonds with other people makes me feel secure.	O	O	O	O	O
My close friends and family are too sensitive to what others say.	O	O	O	O	O
I am concerned that if people knew my faults or weaknesses they would not like me.	O	O	O	O	O
I set my own standards and goals for myself rather than accepting those of other people.	O	O	O	O	O
I worry that somebody I love will die.	O	O	O	O	O
If a goal is important to me I will pursue it even if it may make other people uncomfortable.	O	O	O	O	O
I find it difficult to say "no" to people.	O	O	O	O	O
I censor what I say because I am concerned that the other person may disapprove or disagree.	O	O	O	O	O
I am usually the last person to hear that I've hurt someone by my actions.	O	O	O	O	O
I often find myself thinking about friends or family.	O	O	O	O	O
I would rather take personal responsibility for getting the job done than depend on someone else.	O	O	O	O	O

If a friend has not called for a while I get worried that he or she has forgotten me.	O	O	O	O	O
I spend a lot of time thinking over my decisions.	O	O	O	O	O
It is important to me to be free and independent.	O	O	O	O	O
People I work with often spend too much time weighing out the "pros" and "cons" before taking action.	O	O	O	O	O
Often I fail to consider the possible negative consequences of my actions.	O	O	O	O	O
When I am having difficulty solving a problem, I would rather work it out for myself than have someone show me the solution.	O	O	O	O	O
When I achieve a goal I get more satisfaction from reaching the goal than from any praise I might get.	O	O	O	O	O
If I think I am right about something, I feel comfortable expressing myself even if others don't like it.	O	O	O	O	O
I am uneasy when I cannot tell whether or not someone I've met likes me.	O	O	O	O	O
If somebody criticizes my appearance, I feel I am not attractive to other people.	O	O	O	O	O
I get uncomfortable around a person who does not clearly like me.	O	O	O	O	O
It is more important to be active and doing things than having close relations with other people.	O	O	O	O	O
Sometimes I hurt family and close friends without knowing that I've done anything wrong.	O	O	O	O	O
I tend to fret and worry over my personal problems.	O	O	O	O	O
The possibility of being rejected by others for standing up for my rights would not stop me.	O	O	O	O	O
I need to be engaged in a challenging task in order to feel satisfied with my life.	O	O	O	O	O
I don't enjoy what I am doing when I don't feel that someone in my life really cares about me.	O	O	O	O	O
I like to be certain that there is somebody close I can contact in case something unpleasant happens to me.	O	O	O	O	O
It would not be much fun for me to travel to a new place all alone.	O	O	O	O	O

I am more apologetic to others than I need to be.	O	O	O	O	O
I prize being a unique individual more than being a member of a group.	O	O	O	O	O
If I think somebody may be upset at me, I want to apologize.	O	O	O	O	O
I become particularly annoyed when a task is not completed.	O	O	O	O	O
I find it difficult to be separated from people I love.	O	O	O	O	O

Appendix B: Brief Fear of Negative Evaluation

Read each of the following statements carefully and indicate how characteristic it is of you according to the following scale: 1 = Not at all characteristic of me, 2 = Slightly characteristic of me, 3 = Moderately characteristic of me, 4 = Very characteristic of me, 5 = Extremely characteristic of me.

	1	2	3	4	5
I worry about what other people will think of me even when I know it doesn't make any difference.	O	O	O	O	O
I am unconcerned even if I know people are forming an unfavourable impression of me.	O	O	O	O	O
I am frequently afraid of other people noticing my shortcomings.	O	O	O	O	O
I rarely worry about what kind of impression I am making on someone.	O	O	O	O	O
I am afraid that others will not approve of me.	O	O	O	O	O
I am afraid that people will find fault with me.	O	O	O	O	O
Other people's opinions of me do not bother me.	O	O	O	O	O
When I am talking to someone, I worry about what they may be thinking about me.	O	O	O	O	O
I am usually worried about what kind of impression I make.	O	O	O	O	O
If I know someone is judging me, it has little effect on me.	O	O	O	O	O
Sometimes I think I am too concerned with what other people think of me.	O	O	O	O	O
I often worry that I will say or do the wrong things.	O	O	O	O	O

Appendix C: Cyberball Postexperimental Questionnaire

For each question, please click the number that best represents the **feelings** you were experiencing **during** the game.

Needs: Belonging

	1 – Not at all	2	3	4	5 - Extremely
I felt disconnected	O	O	O	O	O
I felt rejected	O	O	O	O	O
I felt like an outsider	O	O	O	O	O
I felt I belonged to the group	O	O	O	O	O
I felt the other players interacted with me a lot	O	O	O	O	O

Needs: Self-esteem

	1 – Not at all	2	3	4	5 - Extremely
I felt good about myself	O	O	O	O	O
My self-esteem was high	O	O	O	O	O
I felt liked	O	O	O	O	O
I felt insecure	O	O	O	O	O
I felt satisfied	O	O	O	O	O

Needs: Meaningful existence

	1 – Not at all	2	3	4	5 - Extremely
I felt invisible	O	O	O	O	O
I felt meaningless	O	O	O	O	O
I felt non-existent	O	O	O	O	O

I felt important	O	O	O	O	O
I felt useful	O	O	O	O	O

Needs: Control

	1 – Not at all	2	3	4	5 - Extremely
I felt powerful	O	O	O	O	O
I felt I had control over the course of the game	O	O	O	O	O
I felt I had the ability to significantly alter events	O	O	O	O	O
I felt I was unable to influence the actions of others	O	O	O	O	O
I felt the other players decided everything	O	O	O	O	O

Mood

	1 – Not at all	2	3	4	5 - Extremely
Good	O	O	O	O	O
Bad	O	O	O	O	O
Friendly	O	O	O	O	O
Unfriendly	O	O	O	O	O
Angry	O	O	O	O	O
Pleasant	O	O	O	O	O
Happy	O	O	O	O	O
Sad	O	O	O	O	O