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Psychological Characteristics in Seasonal and Nonseasonal Depression

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Abstract

The present study compared three groups of individuals (Seasonal Affective Disorder or SAD, nonseasonally depressed or NSD, and healthy controls) to establish similarities and differences among them in various psychological variables: sociotropy and autonomy, sensitivity to interpersonal rejection, social anxiety (fear and avoidance of performance and social situations), social loneliness, emotional (family and romantic) loneliness, and perceived life stress. These individuals completed the Seasonal Pattern Assessment Questionnaire (SPAQ, Rosenthal, 1993), a diagnostic questionnaire based on the DSM-IV-TR (American Psychiatric Association, 2000) diagnostic criteria for current Major Depressive Episode, a 29-item version of the Hamilton Depression Rating Scale (Rosenthal & Heffernan, 1986), the Liebowitz Social Anxiety Scale - Self-Report version (Liebowitz, 1987), the Sociotropy-Autonomy Scale - Revised (Clark, Steer, Beck, & Ross, 1995), the Perceived Stress Scale (Cohen, Kamarck & Mermelstein, 1983), the Social and Emotional Loneliness Scale for Adults - Short version (DiTommaso & Spinner, 1997), and the Rejection Questionnaire (Coyne, 1976; Hammen & Peters, 1978). Results indicated that compared to the Control group, the SAD and NSD groups when in a depressed state were more sociotropic, feared and avoided social and performance situations to a greater degree, perceived themselves as undergoing more life stress, and experienced more social and family loneliness. No significant differences were found between the NSD and SAD groups, with the exception of SAD having greater seasonal change in their appetite than NSD. When the effects of the depressive scores were partialled out, the three groups were virtually indistinguishable, with the exception of the SAD and NSD groups scoring higher on social anxiety than the Controls.

Psychological Characteristics in Seasonal and Nonseasonal Depression

Within the last two decades, Seasonal Affective Disorder (SAD) has received much research attention. It is defined as recurrent depressive episodes that have their onset in the fall and winter months and remission in the spring and/or summer months (Garvey, Wesner, & Godes, 1988; Magnusson & Boivin, 2003). The onset of SAD tends to occur between the months of September and November and its remission between the months of March and April (Terman, 1988; Terman, Quitkin, Terman, Mcgrath, & Stewart, 1987). The trough in depressed moods tends to occur between December and February and the duration of the SAD depressive episode on the average tends to last five months (Terman, 1988; Terman et al., 1989). There is evidence that summer SAD exists as well where the depression occurs during the summer months and remits during the fall or winter months (Wehr et al., 1991; Wehr, Sack, & Rosenthal, 1987). In this paper, the term SAD refers to winter SAD, which has been the focus of most research.

Several studies revealed that the prevalence of SAD ranges from 0.4% to 10.7% (Blazer, Kessler, & Schwartz, 1998; Booker & Hellekson, 1992; Levitt, Boyle, Joffe, & Zillah, 2000; Mersch, Middendorp, Bouhys, Beersma, & Hoofdakker, 1999; Thompson, Thompson, & Smith, 2004), of which most (83%) are women (Rosenthal & Wehr, 1987). Such prevalence differences are due to the use of different criteria for identifying SAD in different studies, as well as the location of studies in different latitudes and therefore different climates. The age of onset varies around early adulthood (Kane & Lowis, 1999) and the prevalence is highest around the middle of the reproductive years (Eagles, 2001). Women outnumber men by a ratio of 3:1 in the clinical population (Leibenluft, Hardin, & Rosenthal, 1995), and the sex ratio in the general population has been found to vary between 2.5:1 to 9:1 (Bauer & Dunner, 1993; Blehar & Rosenthal, 1989;

Hellekson, 1989; Kane & Lowis, 1999; Winston & Checkley, 1989). This prevalence picture is comparable to that in depression which has been shown to have a prevalence rate of 3% (American Psychiatric Association, 2000) and to have a female: male ratio that typically hovers around 2:1.

The single most noteworthy aspect of SAD is reactivity to climate and environmental lighting changes. It has been consistently demonstrated throughout research that the prevalence of SAD increases with northerly latitude (Booker & Hellekson, 1992; Lee et al., 1998; Magnusson & Axelsson, 1993; Mersch et al., 1999; Rosen et al., 1990; Sourander, Koskelainen, & Helenius, 1999; Terman, 1988). Rosenthal and Wehr (1987) reported that the farther north individuals have lived, the longer and deeper their winter depressions have been. SAD individuals report an improved mood when travelling south (Rosenthal & Wehr, 1987). In addition, SAD individuals show sensitivity to light where increased exposure to light results in mood improvement (Rosenthal et al., 1984; Rosenthal & Wehr, 1987; Rosenthal et al., 1989). Although there is some consensus in the literature on the characteristic features of SAD versus nonseasonal depression, controversial issues regarding SAD do exist, and include the distinctiveness of the disorder, its etiology, treatment response, and the nature of various psychological characteristics.

SAD As A Distinct Disorder

Although the research literature refers to SAD as if it is an established distinct disorder separate from nonseasonal depression, there is an acknowledgement that this conceptualization remains controversial (Bauer, 1992; Bauer & Dunner, 1993; Lee et al., 1998; Schuller, Bagby, Levitt, & Joffe, 1993; Spitzer & Williams, 1989). The similarities and differences between SAD and nonseasonal depression need to be established in research as both conditions are closely

related in their symptomatic characteristics (Bauer, 1992; Bauer & Dunner, 1993). Research that bears on this issue has compared individuals with SAD and individuals with nonseasonal depression on several characteristics such as cognitive style, treatment response (e.g., Blehar & Lewy, 1990) and visuo-spatial deficits (Allen, Lam, Remick, & Sadovnick, 1993). Evidence exists suggesting that SAD may be differentiated from nonseasonal depression in a variety of ways, namely by its high degree of seasonality (Bauer, 1992; Bauer & Dunner, 1993; Rosenthal, 1993; Sher, 2001; Sher, Goldman, Ozaki, & Rosenthal, 1999), concentrated atypical depressive symptoms (Allen et al., 1993; Garvey, Wesner, & Godes, 1988; Meesters, Jansen, Bouhys, Beersma, & van den Hoofdakker, 1993; Rosenthal et al., 1984; Sakamoto, Nakadaira, Kamo, Kamo, & Takahashi, 1995; Young, Watel, Lahmeyer, & Eastmen, 1991), and therapeutic response to light (Eastman, Young, Fogg, Liu, & Meaden, 1998; Lee & Chan, 1999; Terman, Terman, & Ross, 1998; Thalen, Kjellman, Morkid, Wibom, & Wetterberg, 1995). However, the evidence is not conclusive, as conflicting findings have been reported.

Without conclusive etiological and pathophysiological evidence that SAD is indeed different from nonseasonal depression, the DSM-IV-TR (American Psychiatric Association, 2000) does not recognize SAD as a distinct disorder in itself. Instead, in reference to SAD, the seasonal pattern specifier is applied to Major Depressive Disorder, Recurrent, and to Major Depressive Episodes in Bipolar I and Bipolar II disorders. More specifically, for seasonal depression to be diagnosed in an individual in accordance with the DSM-IV criteria, he or she must meet the diagnostic criteria for Major Depressive Disorder Recurrent (or Bipolar I or Bipolar II), show a seasonal pattern to the depression, have experienced the seasonal depression in the last two years, and the seasonal depressive episodes must outnumber nonseasonal depressive episodes in the individual's lifetime. Thus, if there are differences between SAD and

nonseasonal depression other than the seasonal pattern, the classification of the two disorders within one category may be obscuring important treatment-related diagnostic information. It is now an appropriate time for this paper to explore the differences between SAD and nonseasonal depression. This exploration will address the present understanding of the distinctiveness of SAD as well as the research needed to increase our understanding of SAD's nature and etiology.

Distinctions Between SAD and Nonseasonal Depression

Seasonality. Seasonality is considered to be the hallmark of SAD (Lee et al., 1998). The functional definition of seasonality incorporates seasonal changes in both typical depressive symptoms (e.g., energy level, such as decreased activity and lack of energy; socialization, such as social withdrawal, and mood, namely dysphoria) and atypical depressive symptoms (e.g., sleep pattern, namely hypersomnia; food preference, such as carbohydrate craving; and change in appetite, such as an increase) (Bauer & Dunner, 1993; Hardin, Wehr, Brewerton, & Kasper, 1991; Krauchi, Wirz, & Graw, 1993; Rosenthal, 1993; Sher, 2001; Sher et al., 1999; Spitzer & Williams, 1989). These seasonal changes are commonly displayed in individuals with the disorder. Throughout the research literature it has been shown that seasonality is not unique to SAD. A seasonal component has also been found in several other disorders such as anorexia nervosa (Hardin et al., 1991; Wehr & Rosenthal, 1989), bulimia (Hardin et al., 1991), borderline personality disorder (Sakamoto et al., 1995), and nonseasonal bipolar disorder (Rosenthal et al., 1984; Thompson & Isaacs, 1988), for example. Interestingly, these are all disorders that seem to occur more commonly in women than men. The results of several epidemiological studies (Haggag Eklund, Linaker, & Gotestam, 1990; Hellekson & Booker, 1989; Kasper, Wehr, Bartko, Gaist, & Rosenthal, 1989; Potkin, Zetin, Stamenkovic, Kripke, & Bunney, 1986; Rosen et al., 1990; Terman et al., 1989) showed that within the general population, a considerable proportion

of individuals surveyed experience seasonal changes in behaviour and mood that are noted to be problematic. Kasper et al. (1989) found that 92% of the general population reported experiencing seasonal changes.

Since such a large percentage of the general population describes itself as seasonal, it is important to question whether or not it is the severity of seasonality that differentiates those with SAD from those with nonseasonal depression, rather than the presence or absence of seasonality. Several researchers believe that seasonality is unidimensional, where individuals fall somewhere on a continuum between no seasonal change (i.e., nonseasonal individuals) and extreme seasonal change (i.e., SAD individuals) (Bauer, 1992; Bauer & Dunner, 1993; Booker & Hellekson, 1992; Kasper et al., 1989; Rosen et al., 1990; Sher, 2001; Young et al., 1991). Hardin et al. (1991) noted that the *degree* of severity of seasonal changes in both mood and behaviour led to the distinction of SAD from nonseasonal depression. In addition, Thompson and Isaacs (1988) revealed that SAD, nonseasonally depressed, and nonseasonally bipolar populations can be successfully differentiated on the basis of the degree to which their depressive symptoms are seasonal. However, due to the presence of seasonal changes in mood and behaviour in both SAD and nonseasonally depressed populations, it is possible that seasonality is not unique to SAD.

Symptomatology. The symptoms of SAD are very similar to those of depression, such as depressed mood, irritability, decreased libido, social withdrawal, and impaired concentration (Rosenthal, 1993). These symptoms are known as the typical depressive symptoms. However, as previously mentioned there are some atypical symptoms associated with SAD which are less commonly associated with nonseasonal depression such as increased appetite (hyperphagia), carbohydrate craving, and hypersomnia (Garvey et al., 1988; Rosenthal, 1993). Most people with SAD report eating more and gaining weight in the winter months, as well as a change in

their food preference from salads, fruits, and other summer foods to high-carbohydrate meals like breads, pasta, potatoes, and sugary foods in the winter. Terman and colleagues (2003) found that hyperphagia was considerably more frequent in individuals with SAD, where 85% of those with SAD experienced hyperphagia, as opposed to only 48% of those with nonseasonal depression.

Differences in sleep patterns are also demonstrated among patients with SAD and those with nonseasonal depression. Individuals with SAD experience hypersomnia, where they sleep a greater number of hours, but do not feel as refreshed when they wake up. These people have a decrease in a type of deep sleep called "slow-wave sleep" (Rosenthal, 1993). Like nonseasonally depressed individuals, their sleep is often interrupted and of low quality. In contrast, nonseasonally depressed people more commonly report experiencing insomnia, the inability to fall asleep, as opposed to hypersomnia. Both patients with SAD and nonseasonal depression suffer from decreased libido and irritability; however, these symptoms are present only in the winter months for the SAD individuals (Rosenthal, 1993).

Concentration problems are another symptom experienced by both SAD and nonseasonally depressed patients. Cognitive difficulties, such as decreased concentration and short-term memory loss, are often reported by SAD patients as being among the most problematic aspects of their condition (Rosenthal, 1993). People with SAD have difficulty completing tasks that involve logic, and a few have a difficult time estimating distances (Rosenthal, 1993). In addition, both SAD and nonseasonally depressed individuals reveal impairments on visuospatial tasks (Cassens, Wolfe, & Zola, 1990; Grey, Dean, Rattan, & Cramer, 1987; Raskin, Friedman, & DiMascio, 1982).

Nonseasonally depressed people report greater suicidal ideation and morning worsening of mood, than their SAD counterparts (Allen et al., 1993). Anecdotal reports from patients with SAD suggest that the predictable springtime remissions of past episodes reduces the hopelessness experienced during a winter depression, and this may explain the lower rate of suicidal ideation (Allen et al., 1993). However, it is important to note that there is ample evidence that individuals with SAD show an increase in suicide attempts in those with the disorder, with the onset of spring months (Chew & McCleary, 1995; Gabennesch, 1988; Lambert, Reid, Kaye, Jennings, & Esler, 2003; Skakic & Grbesa, 2003). Gabennesch (1988) notes that a person's mood will often lift prior to a suicide attempt, and attributes the peak in spring-time suicide attempts to the "false hope/broken promise hypothesis." He explains that individuals often expect to experience an improvement in their depressive symptoms, with the onset of spring, and regard this as a fresh start. However, when spring time occurs and their symptoms do not improve, the individual's outlook on life becomes bleak yet again, increasing their chances of following through with their suicidal thoughts. In addition, Gabennesch (1988) also notes that the spring may result in an increase in energy levels, thus providing the individual with enough energy to carry out their suicidal thoughts.

Phototherapeutic Response. Seasonal variations in mood and behaviour have been found to relate to bright light (Lewy, Kern, Rosenthal, & Wehr, 1982; Rosenthal et al., 1984). Research shows that a decrease in both the amount of daily sunshine received (Mersch et al., 1999; Molin, Mellerup, Bolwig, Scheike, & Dam, 1996; Sakamoto, Nakadaira, Tamura, & Takahashi, 1993) and in photoperiod (Magnusson & Stefansson, 1993; Mersch et al., 1999; Rosen et al., 1990; Sourander et al., 1999) is associated with a greater prevalence of SAD. As stated earlier, upon moving south, individuals with SAD note a marked improvement in

depressed mood. Several anecdotal studies also found that vacationing in tropical locales alleviates much of the depression they experience (Rosenthal et al., 1984; Rosenthal, 1993; Thase, 1986, 1989). Scant research exists however, regarding whether or not SAD and nonseasonal depression respond differently to natural environmental light.

The current treatment of choice for individuals with SAD is light therapy. It is considered to be the most effective and fast-acting treatment for SAD (Dagleish, Rosen, & Marks, 1996; Partonen & Lonnqvist, 1998; Rosenthal & Wehr, 1987; Thalen et al., 1995). Light therapy involves administering bright artificial light indoors on a daily basis (Terman et al., 1989). More specifically, it entails the presentation of bright (minimum 2,500 lux to a maximum 10,000 lux) artificial light, either white or full-spectrum via a light box or visor. Light therapy should be self-administered daily for a minimum of two hours (Dagleish et al., 1996). Treatment with bright light in the morning results in remission in two-thirds of patients with mild episodes, but in less than half of those with moderate to severe episodes (Partonen & Lonnqvist, 1998). According to a review by Terman, Terman, and Rafferty (1990), morning bright light therapy resulted in a clinical response in 67% of patients with mild depressive episodes and in 40% of those with moderate to severe episodes. Antidepressant response to light therapy can be noted within approximately 3 to 4 days of administration (Lee & Chan, 1999; Terman et al., 1990). The clinical response to the daily administration of light is usually observed within 1 to 2 weeks of the onset of treatment (Meesters et al., 1993; Partonen & Lonnqvist, 1998; Thase, 1989). Research suggests that light therapy is most effective when administered within two weeks of the onset of symptoms and when continued throughout the winter (Dagleish et al., 1996).

Several researchers believed that SAD individuals can be distinguished from those who are nondepressed on the basis of their clinical response to light therapy (Mackert, Eaton,

Wittchen, McGonagle, & Kessler, 1990; Stewart, Quitkin, Terman & Terman, 1990; Volz, Mackert, Stirglitz, & Muller-Oerlingerhausen, 1990; Yerevian, Anderson, Grota, & Bray, 1986). Studies performed by both Stewart and colleagues (1990) as well as Yerevian and colleagues (1986) found that nonseasonally depressed individuals did not experience a response to light therapy, whereas those with SAD did respond. More recent literature however, suggests that nonseasonally depressed individuals experience a similar rate and measure of response to light therapy (Kripke, 1998). Easton (1990) mentioned that the majority of the data from light therapy studies had been gathered from small, open, uncontrolled studies devoid of any placebo controls and that anecdotal evidence such as this could not conclusively prove the differential response of SAD to light therapy. The majority of the antidepressant effects of light could be ascribed to placebo effects, and treatments could only be deemed effective if they created improvements beyond those attributable to placebo effects (Eastman, Lahmeyer, Watell, Good, & Young, 1992; Eastman, Young, & Fogg, 1993). Thus, it is evident that controversial findings exist regarding both SAD and nonseasonally depressed individuals' responses to light therapy, and whether or not the two groups can be reliably distinguished from one another based on their clinical response.

Several studies, however, have found that typical and atypical depressive symptoms show different responses to light therapy (e.g., Lam, Tam, Yatham, Shiah, & Zis, 2001; Lee & Chan, 1999; Terman et al., 1996). Lee and Chan (1999) reported that as the intensity of the light increased, the intensity of an individual's typical symptoms post-therapy decreased. In addition, they discovered that regardless of the light's intensity, atypical symptoms showed a consistent phototherapeutic response. Researchers proposed that these findings suggest the operation of different mechanisms underlying the symptomatology of SAD (Young et al., 1991).

Pharmacotherapeutic Response. Preliminary data from controlled trials indicate that drug treatment may also be effective in individuals with SAD (Partonen & Lonnqvist, 1998). Currently, the main alternative or addition to light therapy is antidepressant medication (Dagleish et al., 1996). Dopamine, serotonin and noradrenaline are neurotransmitters that have all been implicated in SAD (Dagleish et al., 1996). Serotonin was regarded as the first neurotransmitter to be examined as a potential agent in the pathogenesis of SAD, due to its salient role in regulating sleep and appetite, both atypical symptoms of the disorder (Dagleish et al., 1996; Neumeister, Praschak-Riderm, Hebelmann, Rao, et al., 1997; Neumeister, Praschak-Riderm, Hebelmann, Vitouch, Rauh, et al., 1997). The concentrations of serotonin have been demonstrated to vary with the seasons in human beings (Maes et al., 1995; Neumeister et al., 2001). The majority of research pertaining to both SAD and pharmacotherapy has concentrated on drugs that either hinder or heighten serotonin production (Jacobsen et al., 1994; Lam et al., 1995; Mcgrath, Buckwald, & Resnick, 1990; Murdoch & McTavish, 1992; Partonen & Lonnqvist, 1996, 1998; Schlager, 1994; Van der Does, 2001). Tricyclics such as imipramine, selective serotonin re-uptake inhibitors (SSRI's) like fluoxetine and sertraline, and monoamine oxidase inhibitors (MAOI's) like moclobemide are all used in the treatment of SAD and may enhance the effect of light therapy (Dagleish et al., 1996). Beta-blockers, which are drugs that prevent unwanted stimulation of the heart, have also been used effectively in the treatment of SAD (Dagleish et al., 1996).

A review of the research literature suggests mixed results regarding the effectiveness of pharmacotherapy for individuals with SAD. Three different groups of researchers performed double-blind, placebo-controlled parallel trials in order to examine the efficacy of several of the aforementioned drugs. Fitton and colleagues (1992) conducted their study on 31 patients over a

three-week trial. They provided their patients with moclobemide and discovered that the drug was no more effective than a placebo in relieving SAD symptoms. Gram (1994), however, found that the clinical response of two treatments of fluoxetine in a three-week trial of 66 patients proved to have more of an effect than a placebo. It is important to note though that in Gram's (1994) study, fluoxetine had no more of an effect than a placebo when patients were assessed using the change in continuous outcome scores. Murdoch and colleagues (1992) revealed more promising results in an eight-week trial of 142 patients that showed sertraline to be more effective than a placebo. In addition, Schlager's (1994) results showed that propanolol, a short-acting non-selective beta-adrenoceptor blocker, was successful in minimizing depressive symptoms as well as continuing the remission that had been obtained. Finally, in a double-blind active-control parallel trial performed by Partonen and colleagues (1996), it was found that six weeks of treatment with either fluoxetine or moclobemide in 29 patients might be effective in treating winter SAD.

Thus, a review of the research literature reveals evidence to suggest that certain antidepressants used for nonseasonal depression might be efficacious in treating SAD. However, there appears to be a lack of consensus regarding the drug of choice for the disorder. Nevertheless, it is important to note that the majority of the pharmacological trials mentioned involved small sample sizes as well as short assessment periods. Therefore, caution should be used when interpreting the results of these studies.

Conclusions Regarding Distinctions Between SAD and Nonseasonal Depression

A review of the research literature proposes that the differentiation of SAD from nonseasonal depression can be made based on degree of seasonal change in atypical depressive symptoms as well as degree of response to light therapy. As previously mentioned, the literature

suggests that a considerable proportion of the general population undergoes seasonal changes in both mood and behaviour (Haggag et al., 1990; Hellekson & Booker, 1989; Kasper et al., 1989; Potkin et al., 1986; Rosen et al., 1990; Terman, Botticelli, Link, Link, Quitkin, et al., 1989). This has led several researchers to propose that seasonality is unidimensional, based on a continuum from no seasonal change to extreme seasonal change (Bauer, 1992; Bauer & Dunner, 1993; Booker & Hellekson, 1992; Kasper et al., 1989; Rosen et al., 1990; Sher, 200; Young et al., 1991). Thus, it is reported that the degree of severity of seasonal changes in both mood and behaviour is what distinguishes SAD from nonseasonal depression (Hardin et al., 1991; Thompson et al., 1988). Individuals with SAD are purported to experience more of a seasonal change in mood and behaviour compared to their nonseasonally depressed counterparts (Hardin et al., 1991; Thompson et al., 1988).

In summary, a review of the research literature indicates that numerous studies have explored issues such as the distinctiveness of SAD, its etiology, and treatment response. However, an area that remains relatively unexplored is whether or not SAD individuals exhibit distinct psychological characteristics, when compared to those who are nonseasonally depressed.

Psychological Characteristics

Information about psychological characteristics in SAD is useful for a variety of reasons. First, it would help to illuminate the similarities and differences between SAD and nonseasonal depression. Second, it has the potential of furthering our understanding of the possible causal and maintaining factors in seasonal versus nonseasonal depression. Finally, it has treatment implications for both forms of depression. The psychological characteristics that are looked at in the present study include sociotropy and autonomy, sensitivity to interpersonal rejection, social anxiety, loneliness and perceived stress.

Sociotropy and autonomy. Past research performed by Beck (1967, 1976) has focused primarily on the role that cognitive biases play in both eliciting and maintaining depressive episodes. These cognitive biases incorporate characteristics such as inappropriate self-blame and self-criticism, a distorted sense of self, and an emphasis on the negative aspects of events and negative expectations (Sato & McCann, 1997). However, after an in-depth exploration of these cognitive biases, Beck and his co-workers have indicated that there are individual difference variables that possibly contribute to these biases and thus, to depressive symptoms (Sato & McCann, 2000). There has recently been an increased interest in the notion that two relatively stable personality dimensions, coined by Beck (1983), as sociotropy and autonomy, may be of importance in gaining a better understanding of nonseasonal depression (Robins & Block, 1988). Beck (1983) proposed that sociotropy and autonomy may influence an individual's vulnerability to depression and are associated with a variety of facets of depression, including clinical characteristics, precipitating factors, course, as well as treatment response.

Sociotropy (otherwise known as "social dependency") refers to an individual's investment in forming and maintaining positive social relationships (Beck, 1983; Gorski & Young, 2002). Individuals who exhibit a high degree of sociotropic characteristics facilitate their goals by searching out close interpersonal relationships, as their primary motivation in life is to maintain relationships with others (Beck, 1983; Gorski & Young, 2002). A sociotropic individual exhibits characteristics which include a desire for acceptance, intimacy, understanding, support, guidance, sharing, empathy, affection, protection, and help in interpersonal interactions, while striving to avoid disapproval from peers, family and authority figures (Beck, 1983; Gorski & Young, 2002). These individuals are also characterized by excessive reassurance-seeking, thoughts of social undesirability, and feelings of loss. Robins and Luten (1991) found that

sociotropy was significantly related to crying, variability of mood, reactivity of mood, feeling lonely, and was significantly more related to all of these than was autonomy. Sociotropic depression often occurs when there is a perceived loss of a social relationship or perceived rejection by others (Beck, 1983).

Autonomy (otherwise known as "self-criticism") refers to a person's investment in preserving independence and personal rights, and their ability to attain achievement-oriented goals (Beck, 1983; Gorski & Young, 2002). An individual who exhibits autonomous characteristics often achieves their goals by distancing themselves from others. Characteristics of highly autonomous people include the avoidance of failure and increasing control over their environment and others, as well as having minimal knowledge of their effect on surrounding people (Beck, 1983; Gorksi & Young, 2002). There is often a strong emphasis on individuality, self-reliance, and a sense of power for these individuals to do what they want. Robins and Luten (1991) found that autonomy was significantly related to loss of interest or pleasure, loss of interest in people, self-blame, irritability, and concern about inability to function. Autonomy was significantly more highly related to all of these than was sociotropy. Autonomic depression often occurs when there is a perceived achievement-oriented failure or a perceived loss of control over the person's environment (Beck, 1983).

Several researchers have investigated gender differences in sociotropy and autonomy. Autonomy was found to be significantly higher among males than females (Beck, 1983; Gorski & Young, 2002; Robins et al., 1994; Sato & McCann, 1997), although neither are gender-specific constructs. Females scored higher on sociotropy on both Beck's (1983) Sociotropy-Autonomy Scale (SAS) and Robins' and colleagues (1994) Personal Style Inventory (Sato & McCann, 1997).

Gorski and Young (2002) reported that although people usually exhibit attributes that emphasize one mode over the other, an individual may shift from one mode to another depending on different life events. For example, an achievement-oriented test may activate autonomous cognitions and behaviour, such as a strong desire to get the best possible score on a test or a tendency to study late hours for it. According to Beck (1983), people who have a high level of either sociotropy or autonomy will be vulnerable to depression when faced with a threat or loss in a domain corresponding to their specific type of individual investment. Nietzel and Harris (1990) stated that sociotropy appears to be the more "toxic" of the orientations because it involves two depressogenic vulnerabilities, one psychological and the other interpersonal. Autonomy however, is regarded as involving only a psychological vulnerability, as there is no excessive reassurance-seeking to cause interpersonal vulnerability. It has been suggested that the "toxicity" of the sociotropic personality may be due to sociotropic individuals engaging in more maladaptive coping strategies in response to life stress (Nietzel & Harris, 1990).

Several studies have found that there is a strong positive correlation between sociotropy and depression levels, but not between autonomy and depression (Alford & Gerrity, 1995; Gilbert & Reynolds, 1990; Pilon, 1987). Sato and McCann (2000) reported that although previous research has provided abounding support for the relationship between sociotropy and depression, only an infinitesimal amount of support has been provided for the relationship between autonomy and depression. Sato and McCann (1997) found that the majority of the items on the Beck Depression Inventory (BDI) were related to measures of sociotropy rather than autonomy and no relationship between the BDI and autonomy was reported.

In a study performed by Robins (1985), it was reported that mildly depressed participants scored higher on the sociotropy scale than nondepressed participants, but did not differ on the

autonomy scale. Robins placed participants into four different groups, each composed of a combination of high and low sociotropy and high and low autonomy. Results showed that depressed participants were highly concentrated in the high sociotropy-low autonomy group and sparse in the low sociotropy-low autonomy group. The results of this study proposed that as a group, individuals who are high in sociotropy and low in autonomy may be especially vulnerable to depressive episodes.

A study initiated by Robins and Block (1988) revealed that participants who both achieved high scores on the sociotropy scale and disclosed recent negative social events experienced heightened depression scores compared to participants who both achieved low scores on the sociotropy scale and disclosed recent negative social events. Robins and Block stated that their results substantiated Beck's (1983) theory which holds that it is the combination of high sociotropy and negative social events that results in depression.

Research efforts by Clark, Beck, and Brown (1992) indicated that high sociotropy and negative social events were associated with symptoms of mild depression; however high sociotropy and negative autonomy related events did not result in depressive symptoms. In this study, neither the negative social events nor the events related to negative autonomy interacted with autonomy in predicting mild depressive symptoms. In addition, research performed by Rude and Burnham (1993) showed that depression was predicted through the interaction of sociotropy with stressful life events, while autonomy did not interact with achievement-related events in predicting depression.

Finally, in a study by Robins, Block, and Peselow (1989) it was found that sociotropy was related to numerous clinical features of depression. No predicted relationships were found between autonomous personality characteristics and clinical features of depression. However,

Robins and colleagues proposed that there might have been problems with the autonomy measure (Beck, 1983) that they had used, revealed concern about the atypical sex ratio in their study, and suggested that it was important for their findings to be replicated.

As can be seen from the aforementioned studies, there is strong evidence linking sociotropy to depression but the link between autonomy and depression is weaker. All the studies on sociotropy and autonomy have focused on nonseasonal depression and none have been conducted with SAD. One study looked at a related concept, dependency, and reported that SAD patients were less dependent and less self-critical than nonseasonally depressed patients (Schuller, Bagby, Levitt, & Joffe, 1993). Findings from studies that compared individuals with SAD and nonseasonal depression reported SAD to be higher on openness to experience (Bagby, Schuller, Levitt, Joffe, & Harkness, 1996) and narcissism (Schuller et al., 1993). The results suggest that psychological characteristics might potentially aid in distinguishing between the seasonal and nonseasonal form of depression.

Although no studies have compared SAD and nonseasonal depression on sociotropy and autonomy, the pattern of results from previous works suggest that sociotropy might be lower in SAD than in nonseasonal depression, whereas the two groups might not differ on autonomy given that this characteristic bears little relationship to depression.

Sensitivity to interpersonal rejection. One construct that is related to sociotropy is sensitivity to interpersonal rejection. Negatively biased information processing, frequently found among those who are depressed, influences individuals' perception of how others evaluate them and of the quality and amount of support others render (Sacco, 1999). Perceived social exclusion tends to lower state self-esteem, increase subsequent motivation to seek out approval and

acceptance, and affect both interpersonal behaviour and social perceptions (Leary & Downs, 1995).

One of the frequent causes of depression is perceived social exclusion by others (Leary, 1990). Nezlek, Kowalski, Leary, Blevins, and Holgate (1997) stated that if depression is related to perceived exclusion or rejection, depressed individuals may be especially sensitive to rejection. Due to the fact that these individuals already feel less acceptance and integration than those who are nondepressed, depressed individuals may experience more powerful negative reactions to intimations that they are being rejected (Nezlek et al., 1997).

Research shows that depressed individuals *are* more likely to be rejected than are nondepressed individuals (Marcus & Nardone, 1992; Segrin & Abramson, 1994). Howes and Hokanson (1979) used a role-enactment methodology and found that those who were depressed evoked more direct statements of support from others, however not as many positive and neutral conversation-maintaining responses. In addition, more insulting and punishing remarks and expressions of annoyance were elicited. Yarkin, Harvey, and Bloxom (1981) provided participants with a videotape of a female with and without information that she was undergoing depressing circumstances and that she was concerned about her mental well-being. Once participants were given the opportunity to engage with her, individuals who were informed that she was depressed sat farther away, did not initiate as much eye contact, interacted in more negative conversation, and did not spend as much time speaking with her. Robbins, Strack, and Coyne (1979) found that participants showed less willingness to provide positive responses to depressed individuals, and Jacobson (1971) and McLean, Ogston, and Grauer (1973) have proposed that dysphoria commonly evokes hostility and sharp criticism from others. Finally,

Strack and Coyne (1983) found that in a fifteen-minute conversation, depressed individuals prompted hostility, anxiety, and depression in others and were more likely to be rejected.

Segrin and Abramson (1994) discovered three major reasons why depressed individuals are often more rejected and disliked, compared to those who are nondepressed. First, they found that depressed people are frequently unresponsive in their interactions with their partners. Depressed people often do not exhibit much enthusiasm, animation, and attention to individuals with whom they interact (Segrin & Abramson, 1994). This absence of responsiveness provokes a decline in conversation, where any presence of conversation is regarded as being aversive and monotonous for those involved. Evidence shows that individuals who do not exhibit much response to their interpersonal partner tend to evoke more rejection and disinterest from that person (Segrin & Abramson, 1994). Second, Segrin and Abramson found that depressive social behaviour is considered to be "impolite." Depressed people's behaviour is said to possibly compromise other people's need for validation and acceptance as well as fail to satisfy it. Segrin and Abramson found that depressed people frequently communicate (verbally or nonverbally) to others that they have a lack of desire for them, do not approve of them, and are detached. Gotlib and Robinson (1982) reported that depressed participants issued less supportive statements and more negative statements to their interpersonal partners than did those who were nondepressed. Third, the study by Segrin and Abramson revealed that depressive social behaviour persistently infringes upon people's expectations of nonverbal involvement. These expectations are usually a considerable amount of eye contact, smiling, facial expressiveness, proximity, increased touch, gesturing, longer speech duration, more frequent head nods, and relatively fast speech rate (Cappella, 1983; Coker & Burgoon, 1987). Depressed people often fail to meet these expectations upon entering into a conversation. This leads to a negative reception, and possibly

results in withdrawal, compensation, or termination of the interaction (Segrin & Abramson, 1994).

Very little research has been done comparing SAD and nonseasonally depressed individuals on their sensitivity to interpersonal rejection. One study found that rejection sensitivity was more frequent in nonseasonal depression (84%) than in SAD (51%) (Terman et al., 2003). Another study found that SAD patients had greater sensitivity to rejection (Schuller et al., 1993). More work needs to be carried out before it can be established that nonseasonal and seasonal depression can be differentiated on this specific psychological characteristic.

Social anxiety. Social anxiety, also known as social phobia is defined by a persistent fear of embarrassment or negative evaluation while engaged in social interaction or public performance (Rapee, 1995). Activities such as meetings or interactions with strangers, initiating or maintaining social or romantic relationships, attending social gatherings, formal presentations, and those requiring assertive behaviour are commonly feared by individuals with social phobia (Rapee, 1995). A National Comorbidity Survey (Kessler et al., 1994) reported a lifetime prevalence of 13.3% for social anxiety as defined in the DSM-IV-TR (American Psychiatric Association, 2000) and its prevalence appears to be increasing. Magee, Eaton, Wittchen, McGonagle, and Kessler (1996) found that between 4% and 8% of adults in the general population suffer from social anxiety disorder in a given year.

Social anxiety is highly comorbid with other anxiety disorders, depression, and substance abuse and it significantly increases the risk for these disorders (Schneier, Johnson, Hornig, Liebowitz, & Weissman, 1992). When social anxiety is comorbid with depression, it almost always precedes it (Stein et al., 2001). Social anxiety disorder is reported to be the most commonly occurring comorbid anxiety disorder among patients with depressive disorders (Pini

et al., 1997). Depression has been reported to occur in 20%-35% of patients with primary social phobia (deRuiter, Rijken, Garssen, van Schaik, & Kraaimatt, 1989; Kelsey, Thompson, & Evans, 1986). Stein and colleagues reported a definite connection between social anxiety disorder and depression. They found that social anxiety disorder during adolescence or young adulthood is an important predictor of subsequent depressive disorders. In addition, it was reported that the presence of comorbid social anxiety disorder in adolescents with depression is related to a more pernicious course and character of subsequent depressive illness (Stein et al., 2001).

Social anxiety and its role in interpersonal relationships have received regular attention in the social rejection literature. Social exclusion theory proposes that because humans cannot survive and reproduce outside a group environment, anxiety was adaptive as a reaction to real or even potential exclusion (Kelly, 2001). Several studies have demonstrated that feeling rejected or excluded leads to social anxiety (e.g., Geller, Goodstein, Silver, & Sternberg, 1974; Tambor & Leary, 1993). Empirical data support the exclusion theory and the direct link between rejection and anxiety. For example, Tambor and Leary constructed scenarios that depicted two situations in which an individual is socially evaluated: a party and a first date. After reading the scenarios and imagining that they had been either included or excluded by the other people in the situation, rejected participants reported considerably more anxiety than included participants. In Geller and colleagues' (1974) study in which women were either ignored or included in a conversation with two confederates, 41% of the ignored women indicated that they had felt "anxious" during the conversation, as opposed to only 15% of the included women.

Although social anxiety is well researched in nonseasonal depression, it is rarely looked at in relation to SAD. One study that compared SAD with nonseasonal depression on social anxiety showed that the latter group had a greater likelihood of experiencing social anxiety and

were more concerned about how others perceive them (Schuller et al., 1993), suggesting that social anxiety might be a potentially useful differentiating factor between the two forms of depression. More research is required to determine whether Schuller and colleagues' findings are stable across studies.

Loneliness. It has been estimated that at any one time, one in four people is suffering from loneliness (e.g., Cutrona, 1982; Perlman, 1988; Weiss, 1973). Loneliness has been found to be positively related to depression (Hojat, 1983; Leiderman, 1969; Russell, Peplau, & Ferguson, 1978; Weeks, Michela, Peplau, & Bragg, 1980; Young, 1978) and also frequently co-occurs with depression (Weeks et al., 1980). Along with depression, loneliness has been linked to greater anxiety (Hojat, 1983; Russell, Cutrona, Rose, & Yurko, 1984; Russell, Peplau, & Cutrona, 1980).

Like depression, loneliness can undermine the quality of relationships. For example, studies show that lonely children have an increased likelihood of being stigmatized, rejected, and victimized by their peers than nonlonely children (Boivin, Hymel, & Bukowksi, 1995; Rotenberg, Bartley, & Toivonen, 1997). Over time, peer rejection increases withdrawal and subsequent rejection in a treacherous cycle (Boivin et al., 1995). Lonely people often fear being rejected (Wilbert & Rupert, 1986) and that fear may deter them from seeking social contacts.

Over the last two decades of research, two major conceptualizations of loneliness have developed (DiTommaso & Spinner, 1997). The first perspective considers loneliness to be a unitary state that shifts in its intensity and is obtained because of deficient relationships (Russell, 1982, 1996; Russell et al., 1980). The second perspective views loneliness to be "multidimensional and domain specific" (Weiss, 1973; 1998). Several researchers (DiTommaso

& Spinner, 1993; 1997; Russell et al., 1984; Schmidt & Sermat, 1983; Weiss, 1973; 1998) found that different types of loneliness exist, which are qualitatively different from one another.

Weiss (1973) theorized that loneliness is a response to the lack of a specific social provision (i.e., attachment, reassurance of worth and opportunity for nurturance, guidance, social integration, and reliable alliance) or a cluster of them. Thus, Weiss (1973) proposed that two types of loneliness exist: emotional and social. Emotional loneliness often occurs when an individual is experiencing a lack of emotional attachment and feels emotionally isolated. Two types of emotional loneliness exist: family and romantic. DiTommaso and Spinner (1997) reported that emotional loneliness is expected to create an intense feeling of aloneness, anxiousness, hyperalertness, a feeling of being deserted, incessant focusing on possible solutions to the problem, oversensitivity to minimal cues, cautiousness to threat, nameless fear, and consistent appraisal. Social loneliness, on the other hand, according to DiTommaso and Spinner, occurs when an individual is experiencing a lack of social integration, has an inadequate social network, and feels socially isolated. Social loneliness is correlated with depression, boredom, lack of direction and meaning, marginality, motivation to seek out and move among people, in addition to behavioural deviations such as alcoholism and self-talk (DiTommaso & Spinner, 1997). Research showed that more socially lonely individuals were more anxious, depressed, and experienced more severe mental health problems than less socially lonely individuals (DiTommaso & Spinner, 1997). Social loneliness is considered to be the better predictor of depression, as opposed to emotional loneliness (DiTommaso & Spinner, 1997). It is important to note that both types of loneliness share several more general symptoms such as lack of concentration, distress, sleep disturbances, disengagement, dissatisfaction, and restless depression (DiTommaso & Spinner, 1997).

Although loneliness is well researched in nonseasonal depression, it has not been addressed in SAD with the exception of one study. Schuller et al. (1993) reported that nonseasonal depressed individuals have a greater sense of loneliness and social isolation than SAD individuals. However, the study did not distinguish the different forms of loneliness. Given that SAD individuals withdraw socially in the winter months and are more active only in the summer months, they might be just as socially lonely as the nonseasonal depressed individuals. However, nonseasonal depressed individuals might be more emotionally lonely than SAD given the association between loneliness and nonseasonal depression.

Perceived life stress. Life stress has been found to be associated with the onset of depression and with increased severity of depressive symptoms (Fava et al., 1992; Monroe, Harkness, Simons, & Thase, 2001). Research has shown that greater life stress is related to an array of physical disorders in addition to psychological disorders including depression and schizophrenia (Paykel & Dowlatshahi, 1988). Various studies have reported a greater prevalence of life stress before the onset of major depression (e.g., Brown & Harris, 1989; Harkness, Monroe, Simons, & Thase, 1999; Mazure, 1998; Paykel & Cooper, 1992). Life stress has also been found to predict greater severity of depressive symptoms for individuals diagnosed with depression (Dolan, Calloway, Fonagy, DeSouza, & Wakeling, 1985; Hammen, Davila, Brown, & Ellicott, 1992; Monroe, Kupfer, & Frank, 1992).

Researchers have reported that depressed individuals encounter a greater number of negative life events than numerous nondepressed control groups (Billings, Cronkite, & Moos, 1983; Sarason, Johnson, & Siegel, 1978) and the degree of exposure to threatening life events has been linked to a risk of developing depression (Brown, Harris, & Peti, 1973). Kuiper, Olinger, and Lyons (1986) performed a study that indicated a significant moderate relationship

between the depth of depression and the amount of negative life change experienced by the individual. Depressed individuals have an increased likelihood of being in a high arousal state and to overreact to environmental stimuli, which often leads them to magnify their sense of perceived stress (Fava et al., 1992).

Michalak et al. (2004) reported that there were no differences between SAD and nonseasonal depression in the number of threatening life stressors that represented major losses in several domains such as financial, employment, relationships, health, and death. However, whether differences would occur in perceived stress relating to the more minor aspects of everyday living is not known. It is possible that the type of stress that is subjectively more significant might be different for SAD and nonseasonal depression. Whereas life stress might play a more prominent role in nonseasonal depression, the stressor in SAD might be the anticipation of winter or the development of atypical depressive symptoms (such as weight gain) when winter sets in (Rosenthal, 1993; Young, Watel, Lahmeyer, & Eastman; 1991). Dew and Tan (2003) showed that the dread of winter and the experience of atypical depressive symptoms as stressful and impairing were greater in SAD than in nonseasonal depression. Hence, the link between perceived life stress and depression might be stronger in nonseasonal depression than in SAD, whereas the reverse might be found for perceived winter stress. In summary, research shows that stress relating to life events is linked to nonseasonal depression onset and its severity, and that stress relating to winter is more prominent in SAD than in nonseasonal depression.

Conclusions

A review of the above literature suggests that considerable research demonstrates a link between nonseasonal depression and psychological characteristics. Compared to nondepressed individuals, those with nonseasonal depression tend to be more sociotropic, more lonely, more

sensitive to interpersonal rejection, more socially anxious, and to have more life stress. Whether there are differences in these same characteristics between SAD and nonseasonal depression is not known due to the paucity of studies. The little evidence that is available suggests that there is less social anxiety, loneliness, sensitivity to interpersonal rejection associated with SAD than with nonseasonal depression, that there is a link between life stress and nonseasonal depression, and that SAD has higher perceived stress relating to winter.

The Present Study

The present study compared individuals with SAD, individuals with nonseasonal depression (NSD), and healthy nonseasonal controls (Control) on various psychological indices that include sociotropy and autonomy, sensitivity to interpersonal rejection, social anxiety, loneliness, and life stress. While much of previous works have found that nonseasonal depression is associated with more dysfunction in these indices when compared to healthy controls, it is not known whether similar afflictions are found in seasonal depression and to the same degree. Findings from the present study will have implications for elucidating any differences and similarities between SAD and nonseasonal depression.

Some differences between SAD and NSD were expected given that SAD is associated more with environmental vulnerability whereas NSD is viewed as more linked to psychological vulnerability. Hence it was predicted that SAD and NSD would be elevated on sociotropy, sensitivity to interpersonal rejection, social anxiety, emotional loneliness, and perceived life stress when compared to healthy controls. However, it was also predicted that NSD would show these elevations to a greater degree than SAD. More specifically, it was hypothesized that NSD would be more sociotropic, more sensitive to interpersonal rejection, more socially anxious, more emotionally lonely, and have more perceived life stress than SAD.

Method

Participants

A total of 296 individuals (54 males, 242 females) between the ages of 18 and 55 were recruited for the study from the Lakehead University student, faculty, and staff populations as well as from the general community of Thunder Bay during the winter months. Of these, 26 met the appropriate classification criteria for the SAD group (3 male, 23 female), 15 for the NSD group (1 male, 14 female), and 26 for the Control group (5 male, 21 female). There were an additional four individuals who met the Control group criteria who were excluded from the analyses to minimize the problem of unequal cell sizes. The remaining 26 participants who were placed into the Control group for statistical analyses were selected because they better matched the SAD and NSD groups on sex, age, and community versus student participants. Descriptive information about the sample in the present study can be found in "Sample Characteristics" in the Results section. The inclusion criteria for the three groups (SAD, NSD, and Control) are discussed below.

Clinical Criteria for Group Classification

Participants who were categorized into the SAD group were required to meet the following criteria as outlined in Table 1: (a) have a high depression score (as assessed by the 29-item Hamilton Depression Rating Scale) greater than 18, (b) experience a seasonal pattern to the depressive symptoms that appear during the fall/winter months and remit during the spring/summer months, (c) have a high Global Seasonality Score (GSS) of at least 12, (d) report at least a moderate level of impairment with the seasonal symptoms, (e) experience at least 3 years of seasonal pattern to the depressive symptoms within the last 6 years (1997-98 to 2002-03 fall/winter months) of which the seasonal pattern was evident in the last 2 years (2001-02, 2002-

03), (f) have no seasonal stressors or seasonal relocations, and (g) meet the DSM-IV-TR criteria for current major depressive episode. In accordance with the Canadian Consensus Guidelines for the Treatment of Seasonal Affective Disorder (Lam & Levitt, 1999), criterion (e) was considered desirable but not compulsory.

Participants who were categorized into the NSD group had to meet the following criteria: (a) have a high Hamilton total score greater than 18, (b) do not have a seasonal pattern to the depressive symptoms, (c) have GSS $\leq$ 8, (d) have a seasonal impairment of none or mild, and (e) meet the DSM-IV-TR criteria for current major depressive episode.

Participants in the Control group had to meet the following criteria: (a) have a low Hamilton total score of 7 or less, (b) have no seasonal pattern to the depressive symptoms, (c) have GSS < 8, (d) have a seasonal impairment of minimal to none, and (d) do not meet the DSM-IV-TR criteria for current major depressive episode.

Materials

Research Questionnaire

Data were collected via a Research Questionnaire (see Appendix 1) that was used in a larger project on SAD. It had several sections; however, only the sections that were relevant to the present study are discussed below while those that were pertinent to the other studies in the larger project are excluded from the discussion.

Section A (see Appendix 1). This section was designed to obtain demographic information about the participants, to establish whether they relocate during the summer (which could account for seasonal changes in them), and to determine whether they use substances (medication, drugs, alcohol) that could influence their moods and might account for some of their depressive symptoms. Those who regularly (at least once a week) utilized substances that

might contribute to their depression, such as alcohol or street drugs, were excluded from the study to avoid a possible confound.

Section B (see Appendix 1). Items in this section were designed to assess seasonality. This section, which was based on Rosenthal's (1993) Seasonal Pattern Assessment Questionnaire (SPAQ), had several questions that allowed examination as to whether the participants showed the various characteristics associated with SAD:

Question 1 was derived from the SPAQ to ascertain the pattern of seasonality with respect to typical and atypical depressive symptoms. SAD individuals had to demonstrate depressive symptoms during the fall and winter months, and an alleviation of those symptoms during the spring and summer. NSD and Control would not have endorsed any characteristic seasonal pattern.

Question 2 was developed for the larger SAD program of research to assess whether the seasonal pattern was predominant within the last six years, and whether the pattern was evident within the previous two years.

Question 4 was derived from Rosenthal's original SPAQ. It assessed the degree of seasonality by summing the degree of change scores over 6 symptoms. The degree of change was rated on a 5-point scale where 0 indicated no change and 4 indicated extremely marked change. The sum of the ratings would yield a GSS where a score of 0 to 7 suggested no seasonality and a score of 12 or more suggested high seasonality.

Question 5 was derived from the SPAQ and assessed the degree to which the seasonal changes presented an impairment to the respondent. SAD individuals should have endorsed at least a moderate level of impairment (Rosenthal, 1993).

Questions 6 and 7 were developed for the larger SAD program of research to assess the presence of seasonal stressors, as the DSM-IV-TR criteria specifies that the seasonal changes cannot be accounted for by seasonal stressors.

Section C (see Appendix 2). The 29-item Hamilton Depression Rating Scale (HDRS-29) was used to measure the severity of both atypical and typical depressive symptoms. It is based on the 21-item Hamilton Depression Rating Scale (Hamilton, 1960; 1967) that was regarded as insufficient for assessing SAD (Rosenthal, 1989; Wirz-Justice & Anderson, 1990) because it failed to address atypical symptoms. Thus, an additional eight items were created to address atypical symptoms (Terman, 1988; Williams, Link, Rosenthal). A 5-point scale that ranges from 0 (not at all) to 4 (marked or severely) was used to rate each item.

The HDRS-29 was scored in three ways. First, a typical symptom score (HDRS-A) was obtained by summing the responses to items 1 to 21. Second, an atypical symptoms score (HDRS-B) was computed by summing items 22 to 29. Finally, an overall score (HDRS-T) was obtained by summing across items 1 to 29. Greater depression severity was indicated by higher HDRS scores.

Section D (see Appendix 3). This section, the paper version of the Structured Clinical Interview for the DSM Axis I Disorders (SCID), consisted of questions based on the Major Depressive Episode (MDE) module of the computerized version of the NIMH Quick Diagnostic Interview Schedule-III-R (Robins, Helzer, Croughan, & Ratcliff, 1981). These questions, which were designed to diagnose DSM-III-R MDE, were cross-checked with questions from the current SCID Patient Questionnaire (First, Gibbon, Williams, & Spitzer, 1999) based on the DSM-IV. Additional questions were also developed to assess impairment, as well as the exclusionary criteria of depressive symptoms arising from medical conditions, bereavement, and substance

use. The paper SCID essentially was used to assess for the presence of MDE by determining whether the respondent met the DSM-IV criteria, which is identical to the DSM-IV-TR criteria.

Section E (see Appendix 4). The Liebowitz Social Anxiety Scale - Self-Report (LSAS-SR) version contains 24 items that assess fear and avoidance in different social situations that are likely to elicit social anxiety (Liebowitz, 1987). For each situation, the participant was asked to rate their level of fear and avoidance on a 4-point Likert scale. The fear scale ratings range from 0 (no fear) to 3 (severe fear). The avoidance ratings also range from 0 to 3 and are based on the percentage of time spent avoiding the particular situation [0=never; 1=occasionally (10%); 2=often (33-67%); 3=usually (67-100%)]. Along with the fear and avoidance subscales, the LSAS-SR is further divided into two subscales for scoring. These include 11 social interaction situations (e.g., going to a party, meeting strangers) and 13 performance situations (e.g., giving a report to a group, eating in public places).

The LSAS-SR yields a total of seven scores namely: (a) a *total* score obtained by summing over the fear and avoidance ratings for all items; (b) a *total anxiety* score computed by summing the anxiety ratings across all items; (c) a *total avoidance* score based on the sum of avoidance ratings across all items; (d) a *performance anxiety* score obtained by summing the anxiety ratings only for the performance situation items; (e) a *performance avoidance* score derived by summing the avoidance ratings only for the performance situation items; (f) a *social anxiety* score based on the sum of the anxiety ratings only for the social interaction items, and finally, (g) a *social avoidance* score based on the sum of avoidance ratings only for the social interaction items. For the present study, only four scores are of interest, namely performance anxiety, performance avoidance, social anxiety, and social avoidance.

The LSAS-SR is reported to be a reliable, valid and treatment sensitive measure of social phobia (Heimberg et al., 1999). Heimberg and colleagues used a sample of 382 patients from multiple studies to evaluate the psychometric properties of the LSAS. It was reported that the LSAS scores were normally distributed and had good internal consistency. Correlations among the LSAS subscale scores were high, ranging from 0.68 to 0.98. Good convergent validity was also reported between the LSAS and additional social anxiety measures, including the social interaction anxiety scale, the social phobia scale (Mattick & Clarke, 1998), the fear of negative evaluation scale (Watson & Friend, 1969), and the social phobia subscale of the fear questionnaire (Marks & Mathews, 1979). In addition, Heimberg et al. reported adequate discriminant validity with the Beck Depression Inventory (Beck, Rush, Shaw, & Emery, 1979), where the correlation between the LSAS total score and the BDI was 0.56.

Section F (see Appendix 5). The Sociotropy-Autonomy Scale - Revised (SAS-R, Clark, Steer, Beck, & Ross, 1995) is a self-report measure designed to assess the degree to which the participant possesses the constructs of sociotropy and autonomy. It consists of 59 items, of which 29 load on to the autonomy dimension and the remaining 30 items on to the sociotropy dimension. The autonomy dimension is assessed with two subscales: solitude (13 items) and independence (17 items). The items of the autonomy dimension reflect achievement orientation, concern with the possibility of personal failure, and maximization of control over the environment. The solitude dimension measures people's insensitivity and distance from the needs and concerns of others. The independence dimension measures people's individualism, assertiveness, and independence from others. The items of the sociotropy dimension reflect concern about disapproval, attachment/separation, and pleasing others. Each item is rated on a 0 to 4 scale, and thus the range of possible scores is 0 to 52 on the solitude subscale, and 0 to 68 on

the Independence subscale, where higher scores indicate a greater degree of the characteristic. The range of possible scores on the sociotropy scale is 116.

The SAS-R has improved psychometric properties over the original SAS. It is reported to have strong convergent and discriminant validity (Clark et al., 1995). Clark and colleagues found that solitude is positively correlated with dysphoria, perfectionism, self-criticalness, and loneliness. They also found that independence is positively correlated with perfectionism and self-efficacy, but inversely related to concern about approval from others. Finally, they discovered that sociotropy is correlated with dependency, self-criticalness, and affiliation motivation. The three revised subscales are stated to have adequate internal consistency. The sociotropy, solitude, and independence components have Cronbach alpha coefficients of .88, .78, and .74, respectively (Clark et al., 1995).

Section G (see Appendix 6). The Perceived Stress Scale (PSS, Cohen, Kamarck, & Mermelstein, 1983) is a self-report measure of global perceived stress designed to assess the extent to which the participant felt that his/her life has been unpredictable, uncontrollable, and unmanageable during the past month. The PSS focuses on cognitions and emotions relating to general stress levels, rather than specific events or situations (Cohen et al., 1983). The PSS incorporates questions such as, "In the past month, how often have felt that you were unable to control the important things in your life?"

Items are rated on a 5-point frequency scale, ranging from 0 (never) to 4 (very often). A total of seven items are negatively worded (items 1, 2, 3, 8, 11, 12, and 14) and seven items are positively worded (items 4, 5, 6, 7, 9, 10, and 13). A total PSS score is obtained by reversing the scoring on the seven positive items and then summing across all 14 items. Higher summed scores reflect greater perceived stress. Cohen et al. (1983) found that the PSS has acceptable

levels of reliability and validity, with coefficient alphas for the PSS ranging from .84 to .86, and short-term test-retest reliability being .85. The PSS has also been discovered to predict psychological outcomes independently of psychopathology (Cohen, 1986; Cohen et al., 1983; 1993), and has good predictive validity (Cohen, 1993; Fava et al., 1992; Pbert et al., 1992).

Section H (see Appendix 7). The Social and Emotional Loneliness Scale for Adults - Short version (SELSA-S, DiTommaso & Spinner, 1997) is a theory driven, 15-item self-report, multidimensional measure of loneliness. The SELSA-S is a condensed version of the original 37-item SELSA (DiTommaso & Spinner, 1993). The SELSA-S has recently been advocated as the multidimensional loneliness measure of choice (Cramer & Barry, 1999). This measure examines the social loneliness that an individual may have experienced over the past year, as well as two dimensions of emotional loneliness (romantic and family). The social loneliness subscale is comprised of items 2, 5, 7, 9, and 13, the romantic subscale contains items 3, 6, 10, 14, and 15, and the family subscale is composed of items 1, 4, 8, 11, and 12. Items are rated on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Upon scoring, items 2, 3, 5, 6, 8, 9, 11, 12, and 14 are recoded. The three subscale scores are then computed and a higher subscale score indicates greater levels of loneliness in that particular domain.

The SELSA-S has psychometric properties that are comparable to that of the 37-item SELSA. All 3 subscales are highly internally reliable with coefficients ranging from .87 to .90 (DiTommaso, Brannen, & Best, 2004). The SELSA-S is reported to have good concurrent, discriminant, and convergent validity (DiTommaso, Brannen, & Best, 2004).

Section I (see Appendix 8). The Rejection Questionnaire (RQ) was used in the present study to measure the degree of interpersonal rejection that the respondent expects from others. Specifically, the 12 items in the questionnaire ask about the degree to which the respondent

expects others to desire interaction with him/her in different contexts. A greater desire for interaction would indicate a lesser degree of interpersonal rejection. Each of the items are rated on a 5-point scale where one end of the scale represents a strong positive response, "Definitely yes," and the other end represents a strong negative response, "Definitely no."

The RQ was originally devised by Coyne (1976) to assess how a rater would react to a depressed target. Given that the present study did not assess how the respondent reacted to a target, but rather how the respondent believed others would react to him/her, the instructions and item wording for the original RQ were revised slightly in this study to measure the respondent's expectations of interpersonal rejection from others. The RQ has been used extensively in previous studies on interpersonal rejection of depressed targets (e.g., Gotlib & Beatty, 1985; Winer, Bonner, Blaney, & Murray, 1981) and found to have good psychometric properties. The internal consistency of the original RQ has been reported to range from .81 to .96 (Gotlib & Beatty, 1985). Its construct validity has been reported in studies that assessed subjects' interpersonal rejection of depressed targets (Boswell & Murray, 1981; Elliot, Frank, Corcoran, Beardon, & Byrd, 1990; Elliot, Yoder, & Umlauf, 1990; Frank et al., 1987; Gotlib & Beatty, 1985; Gurtman, 1986; Stephens et al., 1987; Strack & Coyne, 1983) and found that depressed targets were rejected more than nondepressed targets.

Procedure

Lakehead University undergraduate students, staff and faculty, as well as individuals from the general community were recruited to participate in this study. Recruitment posters (see Appendix 9) were used to help recruit both student and community participants, and were posted around the campus and in public places in the community, such as supermarkets and malls. In

addition, posters were featured on the community channel of the local cable television and in the local newspaper, "The Chronicle Journal."

The medical practitioners in the community were informed about the study and its recruitment efforts via e-mails that advertised the study. As well, arrangements were made with a local major hospital to access its clinical population. However, due to a misunderstanding between the local hospital and its Ethics Committee in Toronto regarding deadlines for research ethics proposal, the present study was not considered. However, the clinical outpatient population was still accessed via widespread public advertisements in the community.

With regard to students who live on campus, recruitment efforts were made via emails and the daily communication bulletins that were electronically delivered. In order to recruit university students, the experimenter spoke to them during class time, after obtaining permission from the instructor. These university students were told that the study involves interpersonal experiences of people in the winter. Those who wished to participate were given the Informed Consent Form (see Appendix 10) to complete. Research questionnaires were provided in the classes for students to complete at their leisure. Students were instructed to return completed questionnaires to the collection box in the Psychology Main Office. A contact name and telephone number were provided in each of the aforementioned recruitment efforts.

Members of the community who were interested in the study were asked to contact the experimenter who would inform them of the study and informed consent. Copies of the questionnaires were mailed out to them, as well as a postage-paid return envelope for them to return their questionnaires.

Each individual who responded to the recruitment efforts was informed that the present study investigates the interpersonal experiences and psychological functioning of people in the

winter whose mood might cover the wide range from nondepressed to depressed. One bonus point was awarded to Introductory Psychology student participants toward their course marks for participation. Three random prize draws of $100 each were held for non-Introductory Psychology students and Introductory Psychology students who had already collected the maximum number of bonus points in their course, as well as participants from the community.

All participants were given the opportunity to receive a copy of the summary of results upon request. They also received a debriefing form and a list of counseling/therapy resources in the community (see Appendix 11). In addition, participants were provided with the telephone number of the experimenter, should they have any questions. The project supervisor was also available for consultation and assistance if participants felt that either was needed. The research project received approval by Lakehead University's Research Ethics Board.

Results

Research Design

The research design in this study consists of one independent variable, clinical group (Group) with three levels: seasonal affective disorder (SAD), nonseasonally depressed (NSD) and the nonseasonally nondepressed group (Control). The dependent variables are as follows:

i. The four variables from the LSAS-SR, namely performance anxiety (Anxperf), performance avoidance (Avperf), social anxiety (Anxsoc), and social avoidance (Avsoc).

ii. Three subscales on the SAS-R that measure Sociotropy (Sociotro), Solitude, and Independence (Independ).

iii. Total Perceived Stress (Psstotal) measured by the PSS.

iv. Three subscales of the SELSA-S consisting of Social Loneliness (Lonesoc), and the two components of Emotional Loneliness which are Romantic (Lonerom) and Family

(Lonefam).

v. Total Interpersonal Rejection (Rejtotal) measured by the RQ.

Sample Characteristics

Table 2 illustrates the cell sizes and characteristics of the sample. The cell sizes were composed of 15 participants in the NSD group and 26 in both the SAD and Control groups. Every effort was made to match participants across the three groups on age, gender distribution, and community versus student participants. Most of the participants were recruited from the student body while the remaining was recruited from the community. Most of the participants were females. The male to female ratio of each of the three groups was similar, as a chi-square test performed on Sex revealed no significant differences, χ^2 (2, N = 67) = 3.58, p> .05.

The average age of the participants in all three groups were within the early to mid-twenties. An ANOVA conducted on Age as a function of Group did not show a significant effect, F(2, 64) = 1.78, p> .05, effect size η^2 = .05, observed power = .36.

An ANOVA carried out on GSS revealed a significant Group effect, F(2, 64) = 182.60, p< .001, η^2 = .85, observed power >.99. A post-hoc Tukey HSD test showed that SAD was significantly higher (M = 17.19) than NSD (M = 5.33), who was not significantly higher than Control (M = 3.73).

The HRDS-T scores of the SAD and NSD groups were high (M = 49.42 and 39.33 respectively), while that of the Control was low (M = 4.15). An ANOVA performed on HDRS-T as a function of Group showed a significant effect, F(2, 64) = 93.02, p< .001, η^2 = .74, observed power >.99. A post-hoc Tukey HSD test revealed that among the three groups, SAD received a significantly higher score than NSD, which was significantly higher than Control.

The typical scores, HDRS-A, of the SAD (M = 31.65) and NSD (M = 26.27) groups were elevated compared to that of the Control group (M = 3.08). An ANOVA conducted on HDRS-A as a function of Group showed a significant effect, $F(2, 64) = 75.75$, $p < .001$, $\eta^2 = .70$, observed power >.99. A post-hoc Tukey HSD test revealed that both SAD and NSD scored significantly higher than Control, but did not score significantly different from each other.

Similarly, the atypical scores, HDRS-B, of the SAD (M = 17.77) and NSD (M = 13.07) groups were elevated compared to that of the Controls (M = 1.08). An ANOVA performed on HDRS-B demonstrated a significant effect on Group, $F(2, 64) = 47.04$, $p < .001$, $\eta^2 = .60$, observed power >.99. A post-hoc Tukey HSD test revealed that both SAD and NSD were significantly higher than Control, but again, did not score significantly different from each other.

Overview of the Analyses

In order to analyze the data, both univariate and multivariate analysis of variance were used. Separate univariate analyses of variance (ANOVA) with Group as the independent variable were used to examine the data related to Psstotal and Rejtotal. The strength of the association between the independent and dependent variable was denoted by η^2 (Tabachnick & Fidell, 2001, p.52). Post-hoc tests to follow up on significant univariate results were used to detect significant pairwise group differences. A Tukey HSD test was used as it has been found to be the most conservative pairwise test in that it has the greatest control over Type I errors (Klockars & Sax, 1986, p.43).

Separate one-way multivariate analyses of variance (MANOVA)'s with Group as the independent variable were used to analyze the data for (i) fear of performance and social situations (Anxperf and Anxsoc); (ii) avoidance of performance and social situations (Avperf, and Avsoc); (iii) for sociotropy and autonomy subscales (Sociotro, Solitude, and Independ); and

(iv) social and emotional loneliness (Lonesoc, Lonerom, and Lonefam). Pillai's Trace was used to detect multivariate significant effects because it is known to be the most robust criterion of choice with unequal group sizes (Tabachnick & Fidell, 2001, p.348). The strength of the association between the independent variable and each DV was indicated by η^2, which represents the proportion of variance explained in the linear combination of dependent variables (Tabachnick & Fidell, 2001, pp. 338-339).

Significant multivariate effects were followed up with univariate *F*-tests with a Bonferroni type adjustment to determine which dependent variables contributed to the significant group separation. Univariate *F* is reported as being robust to limited violations of normality provided that these violations are not due to outliers (Tabachnick & Fidell, 2001, p.329). The univariate *F*-test is the most common strategy used to follow up on a significant omnibus multivariate effect (Tabachnick & Fidell, 2001, p.349) to determine which dependent variable contributes significantly to group separation. However, correlated dependent variables pose a difficulty for the univariate *F*-tests due to inflated Type I errors. Hence, a Bonferroni-type adjustment is used to address the problem (Tabachnick & Fidell, 2001, p.349).

Once the dependent variables that contribute to group discrimination had been identified, the next step was to determine how the groups differed from one another on these dependent variables. To achieve this, post-hoc Tukey's HSD tests were used to assess for significant pairwise means comparisons among the groups.

The entire data set was then re-analyzed using HDRS-T (total Hamilton score) as a covariate to determine whether group differences existed when the depression scores were partialled out. This would address the possible confound presented by the SAD group having a higher HRDS-T score than the NSD group. Hence, separate univariate analyses of covariance

(ANCOVA) were performed on Psstotal and Rejtotal, and separate multivariate analyses of covariance (MANCOVA) were performed on the following sets of dependent variables (i) Anxperf and Anxsoc; (ii) Avperf and Avsoc, (iii) Sociotro, Solitude, and Independ, and (iv) Lonesoc, Lonerom, and Lonefam. The appropriate test statistics and follow-up tests as described above were employed to pursue any significant univariate or multivariate findings.

Pre-Analysis Issues

Before any statistical analyses were begun, every dependent variable was investigated with regard to accuracy of entry, missing values, and fit between their distributions and the assumptions of multivariate and univariate analysis.

Missing Data

The entire data set was inspected for missing values. All of the participants had a complete set of responses.

Outliers

For each dependent variable, within-group univariate outliers were explored for each of the three groups. Within-group univariate outliers are defined as cases with standardized scores greater than $|z| = 3.29$ (Tabachnick & Fidell, 2001, p.67). In the present study, no univariate outliers were found.

When multivariate outliers were explored, no cases in the present study were identified as such. Within-group multivariate outliers were examined using both the Mahalanobis distance and Cook's D. The Mahalanobis distance strategy recognizes that a multivariate outlier is a case whose distance from the centroid of all other cases within a group exceeds a critical value defined by a χ^2 critical value (Tabachnick & Fidell, 2001, p.68). The critical value depends on several factors, such as the number of people in the group, the number of dependent variables

involved, and the alpha level which can all be examined in a table found in Kiess (1996, p.525). With regard to Cook's D strategy, a multivariate outlier is noted as being any case with a Cook's D greater than 1.00. These cases are viewed as being both deviant and influential when compared to other cases within the group, and are thus considered to be outliers (Tabachnick & Fidell, 2001, p. 69). If multivariate outliers had been found in the present study, they would have been deleted. However, as previously stated, no multivariate outliers were discovered, and therefore no data points were deleted.

Normality, Linearity, and Homoscedasticity

Normality was examined by means of a within-group detrended normality plot for every dependent variable. Linearity and homoscedasticity were explored by means of within-group bivariate scatterplots incorporating dependent variables that were investigated concomitantly in multivariate analyses (Tabachnick & Fidell, 2001, pp. 72-80). Analyses of the present study showed that all of the above assumptions were met, with only a slight violation in a few cases. For the SAD group, these cases include Sociotro, Solitude, Independ, Lonesoc, Lonefam, Lonerom. For the NSD group, these cases consisted of Solitude, Lonesoc, Lonefam, and Lonerom. For the Control group, these cases were comprised of Anxsoc, Anxavtot, Solitude, Lonesoc, Lonefam. Deviation from normality is known to affect Type I error only to a small degree (Stevens, 2002, p. 262).

Multicollinearity and Singularity

Both multicollinearity and singularity were assessed via correlation matrices of all dependent variables for correlations greater than .90 (Tabachnick & Fidell, 2001, pp.82-83). Table 3 reveals that there were no problems with multicollinearity or singularity in the present study.

Main Analysis

Table 4 displays the within-cell descriptive statistics of the dependent variables. The results of the main statistical analyses consisting of ANOVAs and MANOVAs are discussed below.

Perceived Stress Scale

An ANOVA conducted on the total PSS score (Psstotal) as a function of group showed a significant effect, $F(2, 64) = 22.55$, $p < .001$, $\eta^2 = .41$, observed power >.99. A post-hoc Tukey HSD test revealed that both the SAD and NSD groups scored higher on Psstotal than the Control group (see Table 4). The SAD and NSD groups were not significantly different from each other.

Rejection Questionnaire

An ANOVA carried out on the total score for interpersonal rejection (Rejtotal) did not reveal a significant Group effect, $F(2, 64) = 1.20$, $p > .05$, $\eta^2 = .04$, observed power = .25.

Liebowitz Social Anxiety Scale - Self-Report Version

A MANOVA performed on performance anxiety (Anxperf) and social anxiety (Anxsoc) as a function of Group revealed a significant effect, Pillai's Trace = .36, $F(4, 124) = 6.74$, $p<.001$, $\eta^2 = .18$, observed power = .99. It was followed up with a univariate F-test with Bonferroni-type adjustment with each comparison evaluated at $\alpha = .025$. The tests showed that there were significant group differences on Anxperf, $F(2, 62) = 12.25$, $p<.001$, $\eta^2 = .28$, observed power = .99 and on Anxsoc, $F(2, 62) = 14.35$, $p<.001$, $\eta^2 = .32$, observed power >.99. Tukey HSD tests showed that on both Anxperf and Anxsoc, the SAD and NSD groups scored higher than the Control group (see Table 4). There was no difference between the SAD and NSD groups.

A MANOVA performed on avoidance of performance situations (Avperf) and avoidance of social interaction situations (Avsoc) as a function of Group revealed a significant effect,

Pillai's Trace = .38, $F(4, 124) = 7.27$, $p < .001$, $\eta^2 = .19$, observed power >.99. A univariate *F*-test with Bonferroni-type adjustment with each comparison evaluated at $\alpha = .025$ showed that there were significant group differences on Avperf, $F(2, 62) = 12.38$, $p < .001$, $\eta^2 = .29$, observed power >.99 and on Avsoc, $F(2, 62) = 16.75$, $p < .001$, $\eta^2 = .35$, observed power >.99. Tukey HSD tests showed that on both Avperf and Avsoc, the SAD and NSD groups scored higher than the Control group and there was no difference between the SAD and NSD groups (see Table 4).

Sociotropy-Autonomy Scale - Revised

A MANOVA conducted on sociotropy (Sociotro), Solitude, and independence (Independ) showed a significant Group effect, Pillai's Trace = .28, $F(6, 118) = 3.24$, $p < .01$, $\eta^2 = .14$, observed power = .92. A univariate *F*-test with Bonferroni-type adjustment with each comparison evaluated at $\alpha = .0167$ showed that there were significant group differences on Sociotro, $F(2, 60) = 10.22$, $p < .001$, $\eta^2 = .25$, observed power = .98 but not on Solitude or Independ. Tukey HSD tests showed that both SAD and NSD groups scored higher on Sociotro than the Control group (see Table 4).

Social and Emotional Loneliness Scale for Adults - Short Version

A MANOVA was performed on social loneliness (Lonesoc) and the two components of emotional loneliness: romantic (Lonerom) and family (Lonefam). The results revealed a significant Group effect, Pillai's Trace = .25, $F(6, 124) = 3.01$, $p < .01$, $\eta^2 = .13$, observed power = .90. A univariate *F*-test with Bonferroni-type adjustment with each comparison evaluated at $\alpha = .0167$ showed that there were significant group differences on Lonesoc, $F(2, 63) = 9.27$, $p < .001$, $\eta^2 = .23$, observed power = .97 and Lonefam, $F(2, 63) = 5.56$, $p < .01$, $\eta^2 = .15$, observed power = .84. Tukey HSD tests showed that both SAD and NSD groups scored higher on Lonesoc and Lonefam than the Control group (see Table 4).

Summary of Main Analysis

Both SAD and NSD groups were higher than Controls on all dependent variables except for Rejtotal, Solitude, Independ, and Lonerom. However, no differences were found between SAD and NSD. This lack of differences might reflect a confound due to the SAD group having a higher HRDS-T score than the NSD group. Hence, additional analyses were conducted to control for depression severity (HRDS-T) to see whether SAD, NSD and Controls differ when their depression levels are controlled for statistically.

Analysis with a Covariate

In order to check whether or not HRDS-T could be used as a covariate, two assumptions associated with covariate analyses must have been met. The first assumption is that there must be a linear relationship between the covariate and the dependent variable (Stevens, 2002, p.347). Hence, there must be a significant Pearson correlation between HRDS-T and the dependent variables that are entered into the covariate analyses. The correlation matrix (see Table 3) showed that HRDS-T was significantly correlated with all the dependent variables except Independ. Hence all dependent variables with the exception of Independ were included in the covariate analyses.

The second covariate assumption is homogeneity of regression slopes (Stevens, 2002, p.347), where the independent variable (in this study, Group) should not interact with the covariate to account for variance in the dependent variables. This lack of interaction is desired so that there does not need to be different adjustments of the dependent variables for the covariate within each group (Tabachnick & Fidell, 2001, p.331). To check for the second assumption for ANCOVAs, separate full-factorial ANOVAs with Group and HRDS-T were conducted on Psstotal and on Rejtotal. To check for the second assumption for MANCOVAs,

separate full-factorial MANCOVAs with Group and HRDS-T were conducted on (a) Anxperf and Anxsoc; (b) Avperf and Avsoc; (c) Sociotro and Solitude; (d) Lonesoc, Lonerom, and Lonefam. In all of these aforementioned univariate and multivariate analyses, it was found that there was no significant Group by HRDS-T interaction effect on the dependent variables. Hence, the second assumption for the covariate analyses was satisfied.

Given that both covariate assumptions had been met, the covariate analyses were conducted on the various sets of dependent variables. The findings are presented below.

Perceived Stress Scale

An ANCOVA conducted on Psstotal as a function of group with HRDS-T as a covariate did not show a significant Group effect, $F(2, 63) = 2.14, p>.05, \eta^2 = .06$, observed power = .42.

Rejection Questionnaire

An ANCOVA carried out on Rejtotal with HRDS-T as the covariate did not reveal a significant Group effect, $F(2, 63) = .43, p >.05, \eta^2 = .01$, observed power = .12.

Liebowitz Social Anxiety Scale - Self-Report Version

A MANCOVA performed on performance anxiety (Anxperf) and social anxiety (Anxsoc) as a function of Group with HRDS-T as the covariate revealed a significant effect, Pillai's Trace = .36, $F(2, 20) = 5.55, p< .05, \eta^2 = .36$, observed power = .80. A univariate F-test with Bonferroni-type adjustment with each comparison evaluated at $\alpha = .025$ showed that there were significant group differences on Anxsoc, $F(1, 21) = 7.20, p< .025, \eta^2 = .26$, observed power = .73. Tukey HSD tests showed that both SAD and NSD groups scored higher on Anxsoc than the Control group.

In addition, a MANCOVA performed on avoidance of performance situations (Avperf) and avoidance of social interaction situations (Avsoc) as a function of Group with covariate

HRDS-T also did not reveal a significant effect, Pillai's Trace = .13, $F(2, 20) = 1.49$, $p > .05$, $\eta^2 = .13$, observed power = .28.

Sociotropy-Autonomy Scale - Revised

A MANCOVA with HRDS-T as the covariate on Sociotro and Solitude did not show a significant Group effect, Pillai's Trace = .16, $F(2, 20) = 1.94$, $p > .05$, $\eta^2 = .16$, observed power = .35.

Social and Emotional Loneliness Scale for Adults - Short Version

A MANCOVA with covariate HRDS-T was performed on these three dependent variables. The results revealed no significant Group effect, Pillai's Trace = .15, $F(3, 19) = 1.09$, $p > .05$, $\eta^2 = .15$, observed power = .25.

Supplementary Analysis

The main analyses above showed that there were no significant differences between SAD and NSD even when the HRDS-T scores were controlled statistically. It was wondered whether the absence of differences might be due to poor classification of participants into the SAD and NSD groups. Terman et al. (2003) found that hyperphagia was more likely to be found among SAD than nonseasonal depression (85% versus 48%). To determine whether the SAD and NSD groups could be distinguished from each other on hyperphagia, an ANOVA was performed on the GSS item that referred to appetite. The results revealed a significant group effect, $F(2, 64) = 58.81$, $p < .001$, $\eta^2 = .65$, observed power > .99. The Tukey HSD test showed that the SAD group ($M = 2.50$, $SD = .86$) scored significantly higher on this item than did the NSD group ($M = .80$, $SD = .68$), $p < .001$ as well as the Control group ($M = .50$, $SD = .51$), $p < .001$.

Another ANOVA on the Hamilton item "I have eaten more than usual during the past 2 weeks" (item 25) showed a significant Group effect, $F(2, 63) = 19.04$, $p < .001$, $\eta^2 = .38$,

observed power > .99. A post-hoc Tukey test showed that both SAD (M = 2.00) and NSD groups (M = 1.47) scored higher on this item than the Control group (M = .12), $p < .001$ and $p < .01$, respectively.

Discussion

This study compared individuals with seasonal affective disorder (SAD), nonseasonal depression (NSD), and no depression (Control) on several psychological characteristics. They include sociotropy and autonomy, sensitivity to interpersonal rejection, social anxiety (fear and avoidance of performance and social situations), social loneliness, emotional (family and romantic) loneliness, and perceived life stress.

It was hypothesized that compared to healthy controls, SAD and NSD groups would be more sociotropic, more socially anxious, more sensitive to interpersonal rejection, more emotionally lonely, and have greater perceived life stress. These expectations were largely supported by the findings. The two depressed groups were found to be more sociotropic, socially anxious, and to have greater perceived life stress than the nondepressed group. They were also more emotionally lonely with respect to family relationships but not romantic relationships.

The above pattern of findings is congruent with previous works. Studies have shown a strong positive correlation between sociotropy and depression levels (Alford & Gerrity, 1995; Gilbert & Reynolds, 1990; Pilon, 1987). As well, depressed individuals have been found to encounter a greater number of negative life events than numerous nondepressed control groups (Billings et al., 1983; Sarason et al., 1978). Loneliness has also been found to be positively correlated with depression (Hojat, 1983; Leiderman, 1969; Russell et al., 1978; Weeks et al., 1980; Young, 1978). The three groups did not differ on the autonomy dimension (solitude and

independence factors), which is consistent with prior work that has shown that autonomy is quite unrelated to depression (Alford & Gerrity, 1995; Gilbert & Reynolds, 1990; Pilon, 1987).

It was also hypothesized that the SAD group would be less sociotropic, less anxious, less sensitive to rejection, less emotionally lonely, and have less perceived life stress than the nonseasonally depressed group. None of these hypotheses were supported by the results of the present study.

The absence of significant differences between the SAD and NSD group in the present study conflicts with findings from previous works that compared the psychological characteristics of these two groups. More specifically, the current study contradicted the finding of Schuller et al. (1993) who showed that the nonseasonally depressed group had a greater likelihood of experiencing social anxiety than those with SAD. As well, unlike the present study, Terman et al. (2003) found that rejection sensitivity was more frequent in nonseasonal depression than in SAD, and Schuller et al. (1993) reported that SAD patients were more sensitive to rejection than NSD. The loneliness finding of the present study contradicted the finding by Schuller et al. (1993) who showed that nonseasonally depressed individuals have a greater sense of loneliness and social isolation than SAD.

Possible reasons for the variation in results between the present study and those in previous literature might be differences in sample, age of participants, and methodology. The present study used mainly student participants, whereas the participants of Schuller et al.'s (1993) study (the study in which the results of the present study were mostly compared to) were strictly chosen from a patient population. One possibility might lie in the severity of depression within the student versus the patient samples. Schuller et al. used the 17-item Hamilton scale to assess depression severity in the participants. Their SAD patients, on the average, scored 18.9 and the

nonseasonally depressed patients scored 19.7 on the measure. While these scores are considerably lower than the mean Hamilton scores in the present study (SAD = 49.42, nonseasonal depression = 39.33), it has to be kept in mind that the present study used the 29-item Hamilton and not the 17-item version. Given that different versions of the Hamilton scale were used, it is not possible to speak to the depression severity of the samples as a possible factor to explain the discrepancy in findings between the present study and those found by Schuller et al.

However, it would seem that the sample in the present study might be more depressed than those in previous works. In two studies that used the 29-item Hamilton, the SAD group averaged 31.6 (Lam et al., 2001) and 30.6 (Levitan et al., 1998). One study that used the 28-item Hamilton found that the SAD group averaged 29.3 on the measure (Meesters et al., 1993). Levitan et al. (1998) who used the 29-item Hamilton also had a nonseasonal depression group that averaged 34.2 on the measure. It would seem that the sample in the present study is more depressed than those found in previous works. Hence, a data check was made and no error in data entry or interpretation of the Hamilton was found. Whether severity in depression levels would make a difference in the presentation of psychological characteristics within SAD and nonseasonally depressed individuals is not known and could be addressed in future works.

The mean age of participants (23.7 years) in the present study was considerably lower than that in Schuller et al.'s (1993) study, where the average age of the male and female participants were 32.9 years and 38.5 years, respectively. It is also lower than many other studies whose SAD and nonseasonal depression subjects were in their late thirties to early forties (Bagby et al., 1998; Lam, Tam, Yatham, Shiah, & Zis, 2001; Hodges & Marks, 1998; Levitan et al., 1998; Lingjaerde & Foreland, 1999; Mersch et al., 1999; Michalak et al., 2004; Stewart, Quitkin, Terman, & Terman, 1990; Thalen et al., 1995a; Thalen et al., 1995b; Yerevanian,

Yerevanian, Anderson, Grota, & Bray, 1986). The younger age of participants in the present study might partly account for the discrepancy in results between the present study and those from previous works. Older subjects might have more depressive episodes in their lifetime compared to those who are younger. The link between psychological characteristics and depression might be stronger in these older subjects and if any differences between SAD and NSD were to exist, they might emerge in an older rather than a younger sample.

Differences existed in the methodology of the present study and previous work. The present study made use of the paper and pencil SCID to help classify participants, as opposed to the SCID interview, used by Schuller et al. (1993). This SCID interview could have provided more detail and in-depth information, with regard to participant classification.

Finally, there is the question as to whether or not there might have been a problem with the classification of participants into the SAD and NSD groups. This is unlikely given the rigor in classification used where exclusionary and inclusionary criteria were applied, and the severity of depression and seasonality were carefully taken into consideration as well. The supplementary analyses did show that SAD had higher hyperphagia than the nonseasonal depression group on the GSS appetite item but not on the Hamilton hyperphagia item. Taken collectively, the results show that although both SAD and NSD groups both ate more than usual in the previous two weeks of assessment as indicated in the Hamilton, the SAD reported a greater change in appetite due to the seasons than did the nonseasonal depressed. Given that seasonality is the hallmark characteristic of SAD that differentiates it from nonseasonal depression, it would seem that classification of participants into the two depressed groups is not a source of concern.

Overall, the results obtained suggest that individuals with seasonal and nonseasonal depression and who are in their depressive episodes can be distinguished from healthy controls on the basis of their elevations on certain negative psychological characteristics, i.e., sociotropy, fear and avoidance of social and performance situations, greater perceived life stress, and social and family loneliness. However, the SAD and NSD individuals were indistinguishable from each other on those psychological characteristics. It was wondered whether differences in depression severity between the two groups might be a confounding variable and whether group differences in psychological characteristics might emerge if the depression severity was controlled statistically. Hence, a second set of analyses was conducted in which the same analyses were performed with one exception – the depression severity was controlled for across all three groups (SAD, NSD, and Controls) before group differences on the psychological characteristics were examined. The results showed no group differences except social anxiety in which the two depressed groups were elevated compared to the Controls. It would seem that generally, SAD and NSD individuals show a psychological profile that is similar to Controls when their depression levels are held at a level that is equivalent to that of the Controls. The exception is in social anxiety where the two depressed groups were higher than the Control group. Why this difference would emerge is perplexing. Perhaps this finding suggests that social anxiety is a distinct condition from depression and that it tends to be co-morbid with SAD and NSD.

Implications of the Findings

The present study shows that psychological characteristics might not be useful in differentiating SAD from NSD. It also suggests that psychological characteristics might be mood-dependent. While SAD and nonseasonally depressed individuals show a more

dysfunctional profile in their psychological characteristics in comparison to the control group, these differences essentially disappeared, with the exception of social anxiety, when depression severity was controlled for in the analyses. This is corroborated by previous works. Harkness, Bagby, Joffe, and Levitt (2002) found that among 58 outpatients with major depression who completed the NEO-PI at intake, they evidenced significant decreases in Neuroticism scores and significant increases in Extraversion and Conscientiousness scores after up to three months of anti-depressant treatment. Several researchers also found that Neuroticism scores of remitted patients fell within normal limits (Boyce et al., 1989; Hirschfeld & Klerman, 1979; Hirschfeld, Klerman, Clayton, & Keller, 1983a; Hirschfeld et al., 1983b), supporting the hypothesis that the high Neuroticism scores of depressed patients reflect the clinical state of depression rather than stable and chronic personality traits.

Joffe, Bagby, Levitt, Regan, and Parker (1993) used the Tridimensional Personality Questionnaire in their study and found that patients with major depression, who responded to antidepressant treatment, received lower Harm Avoidance scores than those who did not respond to treatment. Thus, Harm Avoidance scores were affected by the individual's state of depression. Chien and Dunner (1996) also found increased Harm Avoidance scores in depressed patients which, however, moved towards values of normal controls upon successful treatment.

Thus, when considering the findings from the present study and previous works, it would be important for future works to compare individuals in remission, as well as in their depressive state. Longitudinal studies might help us to gain a better sense of whether or not these psychological characteristics are indeed mood-dependent.

Strengths

The sample was homogeneous on age, gender distribution, and student versus community participants which helped to reduce confounds due to demographics and enhance the reliability of the findings. The nonseasonally depressed and SAD participants were selected not only on the basis of the DSM-IV criteria, but also on their GSS and Hamilton scores. Numerous studies exist in which participants are selected solely on DSM-III or DSM-IV criteria without taking the GSS and/or Hamilton scores into account (Hodges & Marks, 1998; Michalak et al., 2004; Stewart et al., 1990; Thalen et al., 1995a; Thalen et al., 1995b; Yerevanian et al., 1986), thus not ensuring a sufficient and comparable level of seasonality or depression severity in the groups.

In the present study, rigorous exclusionary criteria were used to make the classification of participants more valid. Participants who used mood-inducing substances such as drugs or alcohol at least once a week or who experienced a seasonal stressor were also excluded to eliminate their confounding influences. Other criteria that were adopted include the seasonal pattern to the symptoms across the months of the year, the presence of the seasonal pattern within the last two years, and impairment assessed by the seasonality. Past studies on SAD typically do not adopt these stringent criteria as they have relied mainly on the Global Seasonality Score to identify individuals with SAD (e.g., Bartko & Kasper, 1990; Mersch et al., 1999, Reichborn-Kjennerud, Lingjaerde, & Dahl, 1994). Finally, by using the SCID questions in the present study, greater confidence can be placed on the classification of a participant as either depressed or nondepressed.

Limitations

The results have to be interpreted with caution given the limitations of the present study. The present study did not make use of the SCID interview, but rather used the paper format for diagnosis. It is not clear whether the SCID interview would have provided more in-depth detail with regard to the individual's experience, as well as more information.

In addition, the sample size in the present study was small. The cell sizes ranged from 15 to 26. This could have limited the power of the statistical analyses to detect between-group differences. For the analyses that yielded no significant results, the power of the tests were low or inadequate, and ranged from .12 to .42. Power of .80 is considered adequate (Murphy & Myors, 1998, p.17). The low power in the present study may have been due to the small effect sizes, which ranged from .01 to .16. A small effect size is considered to be any value below .50 (Murphy & Myors, 1998, p.11). Greater power is associated with greater sample size, bigger effect size, and a higher alpha level that is used to reject the null hypothesis (e.g., using alpha .10 instead of .05).

Another drawback in the present study lies in its sample that consisted primarily of students. This decreases confidence in the external validity and generalizability of the results to the general community and clinical population. Although attempts were made to recruit from the general community and clinical settings by advertising to physicians and the general community, these efforts yielded very little return. An attempt to enlist the assistance of the local hospital was not successful due to a miscommunication of deadlines for research ethics proposals between the local administration in Thunder Bay and the Ethics Committee in Toronto, resulting in the present project not being considered. Perhaps, a different strategy could have been adopted to facilitate access to clinical populations. A collaborative research relationship could

have been built with a clinician(s) who worked within the hospital so that the research project would be undertaken internally within the hospital system and include research questions that would be of functional value to the institution. Such a project could serve the needs of both the researchers and the hospital and strengthen the working relationship between the two parties. Findings derived from the study could be shared with the hospital system especially if it has implications for their service delivery or policy development. A partnership between the researchers and the hospital would facilitate the progress of the research project in various ways, which include having current information on the process of conducting research within the hospital setting and greater commitment and more active involvement on the part of the hospital to recruit clinical participants for the project.

The participants in the present study were young (in their twenties), had similar immediate goals (their education), and occupied similar social roles (students). Incorporating more participants in their thirties and forties may have provided a different set of results, possibly with regard to life stress, as they have different experiences and therefore different stressors. It is more likely for younger students to experience stress associated with exams, and for mature students to face not only exam stress, but also the stress of being a parent and having a family, as well as possibly trying to balance a career with school work.

Finally, it should be noted that the GSS cutoff score for the NSD group in the present study was 8. This is discrepant from Rosenthal et al.'s (1987) guidelines that identify GSS score of 7 or less as low seasonal. Adopting Rosenthal's cutoff score would have resulted in the loss of four individuals from the nonseasonal depression group and an unsatisfactory small cell size. The inclusion of these four individuals was considered acceptable for three reasons. First, their GSS score of 8 was just slightly over the Rosenthal's guideline by 1 score and there was no

reason to assume that an individual with a GSS of 8 would be significantly different from another with a GSS of 7. Moreoever, a GSS of 8 is considerably less than a GSS of 12 which represents Rosenthal's cutoff score for high seasonality. Second, the individuals with a GSS of 8 in the present study did not report seasonal impairment, thereby increasing confidence that they were not seasonal. Third, statistical analysis revealed that the NSD did not differ from the Control group in their GSS even with the inclusion of these four individuals.

Conclusions

Findings from the present study indicate that when in depressive episodes, the SAD and nonseasonally depressed groups were different from the nonseasonally nondepressed individuals in psychological characteristics relating to perceived life stress, social anxiety, sociotropy, social loneliness, and emotional (family) loneliness. However, the two depressed groups did not differ from each other. When the depression scores were controlled for statistically, the three groups were virtually indistinguishable with the exception of social anxiety. This suggests that the psychological characteristics were not stable and were linked to the depression. These findings have to be interpreted with care given the methodological limitations of the present study.

Directions for Future Research

The present study needs to be replicated to determine the reliability and generalizability of its findings. However, its shortcomings need to be addressed in future works. Future research would need to be done with clinical populations, comparing older versus younger individuals, and with bigger sample sizes. It would be beneficial for longitudinal studies to be performed, where SAD and nonseasonally depressed participants are assessed during their depressed as well as remission periods. As well, most of the participants in the present study were females. It is possible that sex differences might show between SAD and nonseasonal depression. Previous

studies have revealed sex differences in psychological characteristics among those with nonseasonal depression where depressed women had higher Neuroticism (Farmer et al., 2002; Jorm, 1987; Katz & McGuffin, 1987; Wilhelm & Hadzi-Pavlovic, 1997) and higher Harm-Avoidance (Richter & Eisemann, 2002) than depressed men. Exploring each of the aforementioned issues would help us to gain a better understanding of whether or not there truly are psychological differences between the two depressive disorders.

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Table 1

Classification criteria for SAD, Depressed, and Nondepressed Groups

Criteria	SAD	Depressed	Nondepressed
Seasonality[a]			
Seasonal pattern[b]	Yes	No	No
Seasonal pattern last 2 years	Yes	No	Irrelevant
GSS[c]	>11	≤ 8	<8
Impairment[d]	At least moderate	No or mild	No or mild
Seasonal stressor	No	Irrelevant	Irrelevant
Depression			
HRDS-28 score	>18	>18	<8
MDE[e]	Positive	Positive	Negative

[a]Seasonality criteria will be assessed with the Seasonal Pattern Assessment Questionnaire (Rosenthal, et al., 1987).

[b]Seasonal pattern refers to the presence of symptoms during the fall and winter months (September to April) and the absence of symptoms during the spring and summer months.

[c]GSS = Global Seasonality Score. The GSS score for SAD is from Rosenthal and colleagues (1987).

[d]Impairment = degree of impairment associated with the seasonal changes. The impairment guideline for SAD is proposed by Rosenthal and colleagues (1987).

[e]MDE = major depressive episode as assessed with the questions based on the QDIS-III-R and the DSM-IV SCID. Positive = minimum of five depressive symptoms including depressed mood and/or loss of interest/pleasure, plus impairment. Symptoms are not due to use of alcohol or drugs, bereavement, or a medical condition.

Table 2

Sample Description and Cell Sizes

Characteristics	Group		
	SAD (n = 26)	Depressed (n = 15)	Nondepressed (n = 26)
Types of participants			
Students	18	14	24
Community	8	1	2
Sex of participants			
Male	3	1	5
Female	23	14	21
Mean age of participants (standard deviation)	26.04 (11.05)	23.73 (11.05)	21.19 (5.43)
Mean HDRS-T[a] (standard deviation)	49.42_x (15.41)	39.33_y (16.30)	4.15_z (2.31)
Mean HDRS-A[b] (standard deviation)	31.65_y (11.51)	26.27_y (10.21)	3.08_z (2.02)
Mean HDRS-B[c] (standard deviation)	17.77_y (7.59)	13.07_y (8.83)	1.08_z (1.23)
Mean GSS[d] (standard deviation)	17.19_y (3.20)	5.33_z (2.26)	3.73_z (2.36)
Mean GSS Appetite[e] (standard deviation)	2.50_y (.86)	$.80_z$ (.68)	$.50_z$ (.51)
Mean HAM Appetite[f] (standard deviation)	2.00_y (1.44)	1.47_y (1.36)	$.12_z$ (.36)

Note. Means in the same row that do not share subscripts differ significantly from each other.

[a]HDRS-T = total score on the HDRS-29; [b]HDRS-A = typical score on the HDRS-29

[c]HDRS-B = atypical score on the HDRS-29;

[d]GSS = Global Seasonality Score on the Seasonal Pattern Assessment Questionnaire

[e]GSS Appetite = score on the GSS item assessing appetite

[f]HAM Appetite = score on the HAM item assessing, "having eaten more in last 2 weeks"

Table 3

Pooled Correlation Matrix of Dependent Variables and HDRS-T

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Anxperf[a]	1												
2. Anxsoc[b]	0.87**	1											
3. Avperf[c]	0.87**	0.76**	1										
4. Avsoc[d]	0.74**	0.83**	0.84**	1									
5. Sociotro[e]	0.69**	0.73**	0.62**	0.59**	1								
6. Solitude[f]	0.53**	0.56**	0.51**	0.50**	0.47**	1							
7. Independ[g]	-0.04	0.03	-0.14	0.03	0.00	0.19	1						
8. Lonesoc[h]	0.31*	0.42**	0.39**	0.59**	0.29*	0.40**	0.15	1					
9. Lonerom[i]	0.30*	0.18	0.30*	0.23	0.23	0.18	-0.03	0.13	1				
10. Lonefam[j]	0.47**	0.56**	0.51	0.65**	0.41**	0.65**	0.03	0.61**	0.21	1			
11. Psstotal[k]	0.57**	0.62**	0.59**	0.62**	0.58**	0.38**	-0.08	0.48**	0.14	0.55**	1		
12. Rejtotal[l]	-0.10	-0.16	-0.13	-0.18	-0.03	-0.13	-0.14	-0.19	0.17	-0.23	-0.11	1	
13. HDRS-T[m]	0.55**	0.54**	0.56**	0.61**	0.45**	0.37**	0.19	0.54**	0.24*	0.54**	0.68**	-0.25**	1

*p<.05 **p<.01 ***p<.001

[a]Anxperf = performance anxiety [b]Anxsoc = social anxiety

[c]Avperf = avoidance of performance situations [d]Avsoc = avoidance of social situations

[e]Sociotro = sociotropy [f]Solitude = solitude [g]Independ = independence

[h]Lonesoc = social loneliness [i]Lonerom = romantic loneliness [j]Lonefam = family loneliness

[k]Psstotal = global perceived stress [l]Rejtotal = interpersonal rejection [m]HDRS-T = total depression severity

Table 4

Means (and Standard Deviations) of the Dependent Variables Within Each Group

Dependent Variable	Group		
	SAD (n = 26)	Depressed (n = 15)	Nondepressed (n = 26)
Social Anxiety			
Anxperf[a]	14.75_y	14.07_y	6.12_z
	(8.32)	(7.01)	(4.46)
Anxsoc[b]	12.33_y	13.59_y	4.46_z
	(7.05)	(6.81)	(4.87)
Avperf[c]	13.25_y	14.07_y	5.58_z
	(8.31)	(6.04)	(4.04)
Avsoc[d]	12.06_y	14.68_y	5.04_z
	(5.91)	(6.43)	(4.89)
Sociotropy and Autonomy			
Sociotro[e]	92.63_y	96.33_y	73.25_z
	(22.37)	(15.07)	(14.09)
Solitude[f]	30.42_z	32.07_z	26.04_z
	(8.93)	(8.01)	(8.77)
Independ[g]	57.67_z	55.27_z	55.08_z
	(9.67)	(5.97)	(7.34)
Social and Emotional Loneliness			
Lonesoc[h]	16.77_y	16.53_y	9.32_z
	(7.21)	(8.53)	(4.76)
Lonerom[i]	19.96_z	21.80_z	17.84_z
	(9.65)	(10.33)	(10.50)
Lonefam[j]	13.46_y	14.71_y	8.00_z
	(7.73)	(9.04)	(4.67)
Perceived Stress			
Psstotal[k]	32.04_y	33.47_y	19.87_z
	(8.92)	(7.92)	(5.65)
Interpersonal Rejection			
Rejtotal[l]	35.85_z	36.46_z	36.77_z
	(1.95)	(2.29)	(2.32)

Note. Means in the same row that do not share subscripts differ significantly from each other.

[a]Anxperf = performance anxiety ; [b]Anxsoc = social anxiety; [c]Avperf = performance anxiety

[d]Avsoc = social anxiety; [e]Sociotro = sociotropy; [f]Solitude = solitude; [g]Independ = independence

[h]Lonesoc = social loneliness; [i]Lonerom = romantic loneliness; [j]Lonefam = family loneliness

[k]Psstotal = total score on PSS; [l]Rejtotal = total score on RQ

Appendix 1

Section A of Research Questionnaire: Demographic Information

Section B of Research Questionnaire: Assessment of Seasonality and SPAQ

RESEARCH QUESTIONNAIRE (SAD 2003-2004)

Section A: ***This section asks for your demographic information. This is for statistical purposes so that we may know the composition of the people in the project.***

Age: _____ Sex: Male / Female Program Year: _____

Marital Status: Single / Common-law / Married / Divorced / Separated / Widowed

Ethnicity, check one:

___ Aboriginal
___ White, not of Hispanic origin (origins in Europe, North Africa, Middle East)
___ Black, not of Hispanic origin (origins in Africa)
___ Asian/Pacific Islander (origins in Far East, Southeast Asia, India Subcontinent, Pacific Islands)
___ Latino or Hispanic (Mexican, Puerto Rican, Cuban, Central or South America, or other Spanish culture or origin)
___ Other, please specify _____

Place of birth (city, country): _____

Place of permanent residence: _____

How long have you lived at your permanent address: ___ years and ___ months

Where do you spend your summer? _____

Are you currently using prescribed medication and/or over-the-counter drugs and supplements (e.g., St. John's Wort)? Yes / No

- if yes, what are they and for what condition?

Do you use alcohol on a regular basis? Yes / No

- if yes, how often do you use alcohol? _____

Do you use mood-altering drugs on a regular basis? Yes / No

- if yes, *what drug* and how *often*? _____

Please list all prescribed medication, over-the-counter drugs, and *supplements (e.g., St. John's Wort)* that you have ha the last 8 weeks:

If you are taking antidepressant medication, we are interested in knowing whether or not you experience any changes your vision after you started taking your medication. Please circle the number on the rating scales below that best describes your visual experience:

Colour appearance

1	2	3	4	5
Faded colour Washed out, Dim		No change		Deeper colour Brighter, Richer

Light/dark contrast

1	2	3	4	5
Low contrast, Low acuity, Less detail, Hazy		No change		High contrast High acuity, Greater detail, Sharp

Do you have any eye diseases such as optic neuritis, retinitis pigmentosa, macular degeneration, glaucoma, detached retina, amblyopia (lazy eye), tunnel vision, cataracts, keratitis, uveitis (eye inflammation)? Yes / No

Do you have any systemic illnesses that affect the retina such as diabetes mellitus or system lupus erythematosis? Yes / No

Do you have any illnesses for which exposure to bright light is contraindicated such as skin cancer? Yes / No

Have you ever had bright light therapy before? Yes / No

- if yes, for how long?
- If yes,when was the last time you had the light therapy?

Do you need corrective visual aids? Yes / No

When was the last time you had an eye examination?

Section B: ***The purpose of this form is to find out if and how your mood and behavior change over time. Please fill in a relevant circles. Note: We are interested in <u>your</u> experience, <u>not</u> <u>others</u> you may have observed.***

1. In the following questions, fill in circles for all applicable months. This may be a single month ●, a cluster of months, e.g., ● ● any other grouping. At what time of the year do you...

	J	F	M	A	M	JN	JL	A	S	O	N	D	No particular month stands out as extreme
A. Feel best	0	0	0	0	0	0	0	0	0	0	0	0	0
B. Tend to gain most weight	0	0	0	0	0	0	0	0	0	0	0	0	0
C. Eat most	0	0	0	0	0	0	0	0	0	0	0	0	0
D. Sleep least	0	0	0	0	0	0	0	0	0	0	0	0	0
E. Feel most energetic	0	0	0	0	0	0	0	0	0	0	0	0	0
F. Socialize least	0	0	0	0	0	0	0	0	0	0	0	0	0
G. Crave carbohydrates most	0	0	0	0	0	0	0	0	0	0	0	0	0
H. Feel worst	0	0	0	0	0	0	0	0	0	0	0	0	0
I. Eat least	0	0	0	0	0	0	0	0	0	0	0	0	0
J. Sleep most	0	0	0	0	0	0	0	0	0	0	0	0	0
K. Lose most weight	0	0	0	0	0	0	0	0	0	0	0	0	0
L. Crave carbohydrates least	0	0	0	0	0	0	0	0	0	0	0	0	0
M. Feel least energetic	0	0	0	0	0	0	0	0	0	0	0	0	0
N. Socialize the most	0	0	0	0	0	0	0	0	0	0	0	0	0

2. Please check the year(s) in the past 6 years which had the same pattern as above:
   _ Sept. 2001/Aug 2002 _ Sept. 2000/Aug. 2001 _ Sept. 1999/Aug. 2000
   _ Sept. 1998/Aug. 1999 _ Sept. 1997/Aug. 1998 _ Sept. 1996/Aug. 1997

3. (a) Please check the year(s) in the past 6 years which DID NOT have the same pattern as above:
   _ Sept. 2001/Aug 2002 _ Sept. 2000/Aug. 2001 _ Sept. 1999/Aug. 2000
   _ Sept. 1998/Aug. 1999 _ Sept. 1997/Aug. 1998 _ Sept. 1996/Aug. 1997

   (b) Please specify how these years marked in 3(a) above differed:

4. To what degree do you change with the seasons on the following? (Circle only one answer per item)

	No Change	Slight Change	Moderate Change	Marked Change	Extremely Marked Change
A. Sleep length	0	1	2	3	4
B. Social activity	0	1	2	3	4
C. Mood (overall feeling of well being)	0	1	2	3	4
D. Weight	0	1	2	3	4
E. Appetite	0	1	2	3	4
F. Energy level	0	1	2	3	4

5. If your experiences in question 4 changes with the seasons, do you feel that they are a problem for you? Yes / No
   - If yes, is this problem:
     __ mild __ moderate __ marked __ severe __ disabling

6. Do you experience any regular occurring, seasonally linked stressors in your life, for example, seasonal unemployment, anniversary of the death of a loved one, etc.? Yes / No
   If yes, please specify what the stressor is and the months you experience it: _____

   _____

7. Is starting school a seasonal stressor for you? Yes / No
   If yes, when does it become a stressor for you? (specify the months): _____

8. By how much does your weight fluctuate during the course of the year?
   _ 0-3 lbs _ 4-7 lbs
   _ 8-11 lbs _ 12-15 lbs
   _ 16-20 lbs _ over 20 lbs

9. Approximately how many hours of each 24-hour day do you sleep during each season, including naps? (Circle only one answer per question)
   WINTER (Dec 21-Mar 20)
   1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 18+
   SPRING (Mar 21-June 20)
   1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 18+
   SUMMER (June 21-Sept 20)
   1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 18+
   FALL (Sept 21-Dec 20)
   1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 18+

10. Using the scale below, indicate how the following weather changes make you feel (fill in only one circle per question):
-3 = in very low spirits or markedly slowed down
-2= moderately low/slowed down
-1= mildly/slowed down
0= no effect
+1= slightly improves your mood or energy level
+2= moderately improves your mood or energy level
+3= markedly improves your mood or energy level

	-3	-2	-1	0	+1	+2	+3	Don't know
A. Cold weather	0	0	0	0	0	0	0	0
B. Hot weather	0	0	0	0	0	0	0	0
C. Humid weather	0	0	0	0	0	0	0	0
D. Sunny weather	0	0	0	0	0	0	0	0
E. Dry weather	0	0	0	0	0	0	0	0
F. Grey and cloudy	0	0	0	0	0	0	0	0
G. Long days	0	0	0	0	0	0	0	0
H. High pollen	0	0	0	0	0	0	0	0
I. Foggy and smoggy	0	0	0	0	0	0	0	0
J. Short days	0	0	0	0	0	0	0	0

11. Do you notice a change in food preference during the different seasons, for example a preference for salts, sweets, fats, or carbohydrates? Yes / No
- If yes, please specify the type of craving and the months they typically occur in:

_____

_____

12. Do you believe you have the seasonal blues (ie. periods of feeling down, or blue, that are linked to specific seasons)? Yes / No

13. If you answered "yes" to question 12, please continue with the items below:

- Please specify the months you are typically blue in: _____
- How old were you when you started having the seasonal blues? _____
- Counting only the years from when you started having the seasonal blues until now, what proportion of the years would say you have the seasonal blues? _____
- How do you know that you have the seasonal blues? What changes, if any, do you notice occurring in yourself, emotio psychologically, mentally, and physically?

_____

_____

_____

- Do you think you are having the seasonal blues NOW? Yes / No
- If you are not having the seasonal blues now, when do you think it will start this year? _____

Appendix 2

Section C of Research Questionnaire: HDRS - 29

Section C: Compared to how you feel when you are in an even or normal mood state, how would you yourself on the following items <u>during the past 2 weeks</u>?

I have been feeling	Not at all 0	Just a little 1	More than just a little 2	Quite a bit, moderately 3	Marked severely 4
1. down and depressed	0	1	2	3	4
2. less interested in doing things	0	1	2	3	4
3. less interested in sex	0	1	2	3	4
4. less interested in eating	0	1	2	3	4
5. that I've lost some weight	0	1	2	3	4
6. that I can't fall asleep at night	0	1	2	3	4
7. that my sleep is restless	0	1	2	3	4
8. that I wake up too early	0	1	2	3	4
9. heavy in my limbs or aches in back, muscles, or head, more tired than usual	0	1	2	3	4
10. guilty or like a failure	0	1	2	3	4
11. wishing for death or suicidal	0	1	2	3	4
12. tense, irritable, or worried	0	1	2	3	4
13. sure I'm ill or have a disease	0	1	2	3	4
14. that my speech and thought are slow	0	1	2	3	4
15. fidgety, restless, or antsy	0	1	2	3	4
16. that morning is worse than evening	0	1	2	3	4
17. that evening is worse than morning	0	1	2	3	4
18. unreal or in a dream state	0	1	2	3	4
19. suspicious of people/paranoid	0	1	2	3	4
20. preoccupied/obsessed that I must check things a lot	0	1	2	3	4
21. physical symptoms when worried	0	1	2	3	4
22. like socializing less	0	1	2	3	4
23. that I have gained weight	0	1	2	3	4
24. that I WANT to eat more than usual	0	1	2	3	4
25. that I HAVE eaten more than usual	0	1	2	3	4
26. that I crave sweets and starches	0	1	2	3	4
27. that I sleep more than usual	0	1	2	3	4
28. that my mood slumps in the afternoons or evenings	0	1	2	3	4
29. less energetic and more lethargic than usual	0	1	2	3	4

Please do not write below this line

Score (1-21)
Supplemental Score (22-29)

Appendix 3

Section D of Research Questionnaire: DSM-IV Diagnostic Questions for Major Depressive Episode

Section D: Please answer the questions below by circling the appropriate answer, or writing in your response.

1. In the last 2 weeks nearly every day, I have felt sad, blue, or depressed	YES	NC
2. In the last 2 weeks, I have lost all interest in things like work or hobbies or things I usually like to do for fun	YES	NC
3a. In the last 2 weeks, I have experienced loss of appetite	YES	NC
b. In the last 2 weeks, I have lost weight <u>without</u> trying to – as much as 2 pounds a week or as much as 10 pounds altogether	YES	NC
c. In the last 2 weeks, I have experienced an increase in appetite	YES	NC
d. In the last 2 weeks, my eating increased so much that I gained as much as 2 pounds a week for weeks or 10 pounds altogether	YES	NC
4a. In the last 2 weeks nearly every night, I have been having trouble falling asleep, staying asleep, or waking up too early	YES	NC
b. In the last 2 weeks nearly every day, I have been sleeping too much	YES	NC
5a. In the last 2 weeks nearly every day, I have been talking or moving more slowly than is normal for me	YES	NC
b. In the last 2 weeks, I have been moving all the time -- that is, I couldn't sit still and paced up and down	YES	NC
6. In the last 2 weeks, I have lacked energy or felt tired out all the time even when I have not been working very hard	YES	NC
7. In the 2 weeks nearly every day, I have been feeling worthless, sinful, or guilty	YES	NC
8a. In the last 2 weeks nearly every day, I have been having a lot more trouble concentrating than is normal for me	YES	NC
b. In the last 2 weeks nearly every day, my thoughts have come much slower than usual or seemed mixed up	YES	NC
c. In the past 2 weeks nearly every day, I have been unable to make up my mind about things I ordinarily have no trouble deciding about	YES	NC
9a. In the past 2 weeks, I have thought a lot about death – my own, someone else's, or death in general	YES	NC
b. In the past 2 weeks, I have felt like I wanted to die	YES	NC
c. In the past 2 weeks, I have felt so low I thought about committing suicide	YES	NC
d. I have attempted suicide in the past	YES	NC

If you answered "yes" to any of the items 1-9, complete the rest of the questionnaire:

10. How did the symptoms above affect your life (work, social, personal, family), if any?

11. Are the symptoms above due to:

(a) the death of someone or something close to you	YES / NO
(b) a medical condition	YES / NO
(c) use of medication, drugs or alcohol	YES / NO

Appendix 4

The Liebowitz Social Anxiety Scale - Self-Report Version

Section E: Please fill out the following questionnaire with the most suitable answer listed below. Base your answers on your experience in the past week and, if you have completed the scale previously, be as consistent as possible in your perception of the situation described. Be sure to answer all items.

Fear or Anxiety	Avoidance
0 = None	0 = Never (0%)
1 = Mild	1 = Occasionally (1%-33% of the time)
2 = Moderate	2 = Often (33%-67% of the time)
3 = Severe	3 = Usually (67%-100% of the time)

Understanding the situations:	Fear or Anxiety	Avoidance
1. **Telephoning in public** - speaking on the telephone in a public place		
2. **Participating in small groups** - having a discussion with a few others		
3. **Eating in public places** - do you tremble or feel awkward handling food		
4. **Drinking with others in public places** - refers to any beverage		
5. **Talking to people in authority** - for example, a boss or teacher		
6. **Acting, performing or giving a talk in front of an audience** - refers to a large audience		
7. **Going to a party** - an average party where you know some but not all people		
8. **Working while being observed** - any type of work you might do including school work or house work		
9. **Writing while being observed** - i.e., signing a check in a bank		
10. **Calling someone you don't know very well**		
11. **Talking with people you don't know very well**		
12. **Meeting strangers** - assume others are of average importance to you		
13. **Urinating in a public bathroom** - assume that others are sometimes present, as might normally be expected		
14. **Entering a room when others are already seated** - refers to a small group, and nobody has to move seats for you		
15. **Being the center of attention** - telling a story to a group of people		
16. **Speaking up at a meeting** - speaking from your seat in a small meeting or standing up in place in a large meeting		
17. **Taking a written test**		
18. **Expressing appropriate disagreement or disapproval to people you don't know very well**		
19. **Looking at people you don't know very well in the eyes** - refers to appropriate eye contact		
20. **Giving a report to a group** - refers to an oral report to a small group		
21. **Trying to pick up someone** - refers to a single person attempting to initiate a relationship with a stranger		
22. **Returning goods to a store where returns are normally accepted**		
23. **Giving an average party**		
24. **Resisting a high pressure salesperson** - avoidance refers to listening to the salesperson for too long		

Appendix 5

The Sociotropy-Autonomy Scale - Revised

Section F: *Please indicate what percentage of the time each of the statements below applies to you by using the scale to the left of the items. Choose the percentage that comes closest to how often the item describes you. Mark your answer on the scoring sheet.*

PERCENT DESCRIBES YOU

0%	25%	50%	75%	100%	
A	B	C	D	E	1. I would be uncomfortable dining out in a restaurant by myself.
A	B	C	D	E	2. I get uncomfortable when I am not sure how I am expected to behave in the presence of other people.
A	B	C	D	E	3. I focus almost exclusively on the positive outcomes of my decisions.
A	B	C	D	E	4. It is important to be liked and approved of by others.
A	B	C	D	E	5. I feel more comfortable helping others than receiving help.

0%	25%	50%	75%	100%	
A	B	C	D	E	6. I am very uncomfortable when a close friend or family member decides to "pour their heart out" to me.
A	B	C	D	E	7. I am reluctant to ask for help when working on a difficult and puzzling task.
A	B	C	D	E	8. When I am with other people, I look for signs whether or not they like being with me.
A	B	C	D	E	9. When visiting people, I get fidgety when sitting around talking and would rather get up and do something.
A	B	C	D	E	10. I am more concerned that people like me than I am about making important achievements

0%	25%	50%	75%	100%	
A	B	C	D	E	11. I am afraid of hurting other people's feelings.
A	B	C	D	E	12. People rarely come to me with their personal problems.
A	B	C	D	E	13. I sometimes unintentionally hurt the people I love the most by what I say.
A	B	C	D	E	14. I feel bad if I do not have some social plans for the weekend.
A	B	C	D	E	15. I tend to be direct with people and say what I think.
A	B	C	D	E	16. People tend to dwell too much on their personal problems.
A	B	C	D	E	17. Once I've arrived at a decision, I rarely change my mind.

0%	25%	50%	75%	100%	
A	B	C	D	E	18. Being able to share experiences with other people makes them much more enjoyable for me.
A	B	C	D	E	19. I do things that are not in my best interest in order to please others.
A	B	C	D	E	20. I prefer to "work out" my personal problems by myself.
A	B	C	D	E	21. When I have a problem, I like to go off on my own and think it through rather than being influenced by others.
A	B	C	D	E	22. I find it hard to pay attention to a long conversation, even with friends.
A	B	C	D	E	23. I get lonely when I am at home by myself at night.
A	B	C	D	E	24. The worst part about growing old is being left alone.

0%	25%	50%	75%	100%	
A	B	C	D	E	25. Having close bonds with other people makes me feel secure.
A	B	C	D	E	26. My close friends and family are too sensitive to what others say.
A	B	C	D	E	27. I am concerned that if people knew my faults or weaknesses they would not like me.
A	B	C	D	E	28. I set my own standards and goals for myself rather than accepting those of other people.
A	B	C	D	E	29. I worry that somebody I love will die.
A	B	C	D	E	30. If a goal is important to me I will pursue it even if it may make other people uncomfortable.
A	B	C	D	E	31. I find it difficult to say "no" to other people.

0%	25%	50%	75%	100%	
A	B	C	D	E	32. I censor what I say because I am concerned that the other person may disapprove or disagree.
A	B	C	D	E	33. I am usually the last person to hear that I've hurt someone by my actions.
A	B	C	D	E	34. I often find myself thinking about friends or family.
A	B	C	D	E	35. I would rather take personal responsibility for getting the job done than depend on someone else.
A	B	C	D	E	36. If a friend has not called for a while I worry that he or she has forgotten me.
A	B	C	D	E	37. I spend a lot of time thinking over my decisions.
A	B	C	D	E	38. It is important to me to be free and

independent.

0%	25%	50%	75%	100%	
A	B	C	D	E	39. People I work with often spend too much time weighing out the "pros" and "cons" before taking action.
A	B	C	D	E	40. When I am having difficulty solving a problem, I would rather work it out for myself than have someone else show me the solution.
A	B	C	D	E	41. Often I fail to consider the possible negative consequences of my actions.
A	B	C	D	E	42. When I achieve a goal I get more satisfaction from reaching the goal than from any praise I might get.
A	B	C	D	E	43. If I think I am right about something, I feel comfortable expressing myself even if others don't like it.
A	B	C	D	E	44. I am uneasy when I cannot tell whether someone I've met likes me.
A	B	C	D	E	45. If somebody criticizes my appearance, I feel like I am not attractive to other people.

0%	25%	50%	75%	100%	
A	B	C	D	E	46. I get uncomfortable around a person who does not clearly like me.
A	B	C	D	E	47. It is more important to be active and doing things than having close relations with other people.
A	B	C	D	E	48. Sometimes I hurt family and close friends without knowing I've done anything wrong.
A	B	C	D	E	49. I tend to fret and worry over my personal problems.
A	B	C	D	E	50. The possibility of being rejected by others for standing up for rights would not stop me.
A	B	C	D	E	51. I need to be engaged in a challenging

task in order to feel satisfied with my life.

0%	25%	50%	75%	100%	
A	B	C	D	E	52. I don't enjoy what I am doing when I I don't feel that someone in my life really cares about me.
A	B	C	D	E	53. I like to be certain that there is somebody close I can contact in case something unpleasant happens to me.
A	B	C	D	E	54. It would not be much fun for me to travel to a new place all alone.
A	B	C	D	E	55. I am more apologetic to others than I need to be.
A	B	C	D	E	56. I prize being a unique individual more than being a member of a group.
A	B	C	D	E	57. If I think somebody may be upset at me, I want to apologize.
A	B	C	D	E	58. I become particularly annoyed when a task is not completed.
A	B	C	D	E	59. I find it difficult to be separated from people I love.

Appendix 6

The Perceived Stress Scale

Section G: *The questions in this scale ask you about your feelings and thoughts **during the last month**. In each case, you will be asked to indicate by circling **how often** you felt or thought a certain way.*

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often

1. In the last month, how often have you been upset because of something that happened unexpectedly?..... **0 1 2 3 4**

2. In the last month, how often have you felt that you were unable to control the important things in your life?..... **0 1 2 3 4**

3. In the last month, how often have you felt nervous and "stressed"?..... **0 1 2 3 4**

4. In the last month, how often have you dealt successfully with irritating life hassles?..... **0 1 2 3 4**

5. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?..... **0 1 2 3 4**

6. In the last month, how often have you felt confident about your ability to handle your personal problems?..... **0 1 2 3 4**

7. In the last month, how often have you felt that things were going your way?..... **0 1 2 3 4**

8. In the last month, how often have you found that you could not cope with all the things that you had to do?..... **0 1 2 3 4**

9. In the last month, how often have you been able to control irritations in your life?..... **0 1 2 3 4**

10. In the last month, how often have you felt that you were on top of things?..... **0 1 2 3 4**

11. In the last month, how often have you been angered because of things that happened that were outside of your control?..... **0 1 2 3 4**

12. In the last month, how often have you found yourself thinking about things that you have to accomplish?..... **0 1 2 3 4**

13. In the last month, how often have you been able to control the way you spend your time?..... **0 1 2 3 4**

14. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?..... **0 1 2 3 4**

Appendix 7

The Social and Emotional Loneliness Scale for Adults - Short Version

Section H: *On this page you will find a number of statements that an individual might make about his/her social relationships. Please read these statements carefully and indicate the extent to which you agree or disagree with each one as a statement about you, using the 7-point rating scale provided to the right of each question.*

Please take a moment to think about your relationship with your partner, your family and your friends over the past year. Please circle the number that best reflects the degree to which each of the following statements describes your thoughts and feelings during the PAST YEAR. A response of 1 means ***strongly disagree*** *and a response of 7 means* ***strongly agree.*** *Please try to respond to each statement.*

In the past year:	***Strongly Disagree***						***Strongly Agree***
1. In the last year I felt alone when I was with my family.....	1	2	3	4	5	6	7
2. In the last year I felt part of a group of friends.....	1	2	3	4	5	6	7
3. In the last year I had a romantic partner with whom I shared my most intimate thoughts and feelings.....	1	2	3	4	5	6	7
4. In the last year there was no one in my family I could depend upon for support and encouragement, but I wish there had been.....	1	2	3	4	5	6	7
5. In the last year my friends understood my motives and reasoning.....	1	2	3	4	5	6	7
6. In the last year I had a romantic or marital partner who gave me the support and encouragement I needed.....	1	2	3	4	5	6	7
7. In the last year I didn't have a friend(s) who shared my views, but I wish I had.....	1	2	3	4	5	6	7
8. In the last year I felt close to my family.....	1	2	3	4	5	6	7
9. In the last year I was able to depend on my friends for help.....	1	2	3	4	5	6	7
10. In the last year I wished that I had a more satisfying romantic relationship.....	1	2	3	4	5	6	7
11. In the last year I felt a part of my family.....	1	2	3	4	5	6	7
12. In the last year my family really cared about me.....	1	2	3	4	5	6	7

In the past year:	*Strongly Disagree*						*Strongly Agree*
13. In the last year I didn't have a friend(s) who understood me, but I wish I had.....	1	2	3	4	5	6	7
14. In the last year I had a romantic partner to whose happiness I contributed.....	1	2	3	4	5	6	7
15. In the last year I had an unmet need for a close romantic relationship.....	1	2	3	4	5	6	7

Appendix 8

The Rejection Questionnaire

Section I: *The questions below refer to how you believe a stranger might judge **you**, as well as the degree of rejection or acceptance you might experience, if you were to meet someone for the first time. Please respond to the questions by circling the number on the scale following the question that best describes your answer. The number 1 represents **definitely yes** and the number 5 represents **definitely no.***

1. Would the other person like to meet you again?

1----------2----------3----------4----------5
Definitely yes Definitely no

2. Would the other person like to sit next to you on a 3-hour bus trip?

1----------2----------3----------4----------5
Definitely yes Definitely no

3. Would the other person be willing to work on a job with you?

1----------2----------3----------4----------5
Definitely yes Definitely no

4. Would the other person be willing to eat lunch with you often?

1----------2----------3----------4----------5
Definitely yes Definitely no

5. Would the other person invite you to their home?

1----------2----------3----------4----------5
Definitely yes Definitely no

6. Would the other person be willing to share an apartment with you?

1----------2----------3----------4----------5
Definitely yes Definitely no

7. Would the other person want to become a close friend of yours?

1----------2----------3----------4----------5
Definitely yes Definitely no

8. Would the other person be willing to have you supervise their work?

1----------2----------3----------4----------5
Definitely yes Definitely no

9. Would the other person ask you for advice?

1----------2----------3----------4----------5
Definitely yes Definitely no

10. Would the other person find you to be physically attractive?

1----------2----------3----------4----------5
Definitely yes Definitely no

11. Would the other person find you to be socially poised?

1----------2----------3----------4----------5
Definitely yes Definitely no

12. Would the other person approve of you marrying a close relative of theirs?

1----------2----------3----------4----------5
Definitely yes Definitely no

Appendix 9

Recruitment Poster

Lakehead
University

Looking for Research Participants

STUDY ON INTERPERSONAL EXPERIENCES OF PEOPLE IN THE WINTER

The Department of Psychology, Lakehead University, is looking for volunteers to complete a research questionnaire for a project on psychological functioning and interpersonal experiences. Those who are between the ages of 18-55 and who have either depression, winter blues, or no depression are particularly encouraged to respond. All responses in this research project will be kept strictly confidential. All participants will be entered into 3 $100 random prize draws.

For more information, please call Andrea at 343-8978 or email her at researchproject_1@ hotmail.com.

Appendix 10

Informed Consent Form

INFORMED CONSENT FORM

(To protect your anonymity, this form will be detached from your research questionnaire before any of your responses are examined).

1. Title of research: *Interpersonal Experiences in Winter.*

2. This study is open to individuals who are between the ages of 18 and 55. It investigates the emotional, cognitive, and behavioural experiences of people in different situations, including the winter. As a research participant, you will be asked to complete a questionnaire that asks questions about what you think and feel, and how you behave. Some of the questions will be general while others are more specific. Completion of the questionnaire typically takes about 1 hour.

3. Your participation is strictly voluntary. You are free to withdraw from the study at any time without explanation or penalty. You are free to refrain from answering any questions that you do not wish to answer; however, we do encourage you to answer all questions as your responses would more make sense if all questions are answered. All your responses are strictly confidential and anonymous. There are no risks or benefit to you for participating in this study. If you wish to receive a copy of the results of the study, we will mail them to you upon completion of the project.

4. If you are an Introductory Psychology student, you will receive 1 bonus point towards your course marks for your participation. If you are not an Introductory Psychology student, you will be entered into three $100 random prize draws. If you are an Introductory Psychology student who has already maximized the number of bonus points you can get, you will be entered into the three $100 random prize draws .

5. All data will remain in secure and confidential storage with Dr. Josephine Tan (the project supervisor) at Lakehead University for seven years. After that, the questionnaires will be destroyed.

If you have read the above, understand it, and wish to participate in this study, please sign below to indicate your informed consent for participation. By signing, you are also confirming that you are between the age of 18 to 55 inclusive.

Print your name here	Your signature	Date

1. To Receive Results of the Study

If you wish to receive a copy of the results, please write below your NAME and permanent POSTAL ADDRESS:

Name:

_____

Permanent address:

_____

_____

Postal code: _____

2. Bonus Points for Introductory Psychology

If you are an Introductory Psychology student who is eligible to receive 1 bonus point for your participation in this study, please complete this section so that we can credit you:

Name: _____

Student ID: _____

Name of your instructor: _____

3. Lottery Draw Winner Notification

If you are entered into the random prize draws and end up being a winner, how can we contact you during the spring/summer of 2004?

Name: _____

Tel: _____

Mailing address with postal code: _____

_____

_____

Appendix 11

Debriefing

Please read this page only AFTER you are done with the Research Questionnaire to protect the integrity of your responses!

Debriefing

Thank you for helping out in this study. At this point, I'd like to give you some more information on this study. The reason why we are conducting this study is to find out how individuals who are depressed, seasonally depressed, and nondepressed differ in their psychological characteristics.

People who are depressed and seasonally depressed are quite similar to each other in their depressive symptoms with 2 important differences. First, people with seasonal depression get depressed in the fall and winter and feel fine in the summer. That is, their depression follows the seasons. Second, people with seasonal depression have some atypical symptoms such as oversleeping, overeating, and carbohydrate craving that are less common in nonseasonal depression.

We are interested in finding out how people with seasonal depression, nonseasonal depression, and no depression differ on their personality style of either sociotropy (a person's investment in forming and maintaining positive social relationships) or autonomy (a person's investment in preserving independence, personal rights, and ability to attain achievement-oriented goals), sensitivity to interpersonal rejection, as well as differences in social anxiety, loneliness, and life stress.

Research indicates that people who have nonseasonal depression value interpersonal relationships and are vulnerable to interpersonal rejection. Some of them may be socially anxious. Others are socially and/or emotionally lonely, and may report more stress in their lives than the average person. Whether these characteristics are also found in individuals with seasonal depression and in those who are not depressed, and the degree to which they exist, is something that we hope to found out from this study.

Your participation today will be invaluable in helping us to understand further where the differences between seasonal and nonseasonal depression lie. Thank you very much for your help, it is greatly appreciated and we could not have done it without you. If you or anyone you know is feeling depressed or psychologically distressed, there is help available. On the following page, there is a listing of resources that people can access, and we do encourage individuals to seek psychological assistance if they feel they need it to help them get over their distress.

Before we end this study, we would like you to please not talk about this study with anyone. There are many people who have not yet participated in this study. If they hear from you or through the grapevine what this study is all about, it may influence their responses. Our results will not be accurate and the study will be ruined. We hope that you will cooperate with us in this regard. If you have any questions at all, please don't hesitate to contact either myself, the experimenter (Andrea) at or Dr. Josephine Tan at . Thank you.

Resources for Therapy/Counselling

Please feel free to detach this page and keep it for your information.

Self-referrals are available at:

- Lakehead University Health and Counselling Centre (open only to Lakehead University students): 343-8361
- Family Services Thunder Bay: 684-1880
- Catholic Family Development Centre: 345-7323
- NorWest Community Health Centre: 622-8235
- Community Mental Health Program @ Thunder Bay Regional Hospital: 343-7199
- Employee Assistance Plan (for employees in companies that have coverage): contact Human Resources of the company
- Private practitioners: Look up in the yellow pages under Psychologists and Psychological Associates; Psychotherapy; and Marriage, Family & Individual Counsellors

Emergency Services are available at:

- Thunder Bay Crisis Response Service (24 hours): 346-8282
- Thunder Bay Regional Health Sciences Centre

For more information on mental health services:

- Canadian Mental Health Association: 345-5564
- Community Information & Referral Centre Information Helpline: 626-9626