Running Head: WINTER-SUMMER COMPARISON OF

Winter-Summer Comparison of Psychological Factors in Seasonal Mood Changes

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Abstract

Seasonal Affective Disorder (SAD) is characterized by the regular onset and remission of depressive episodes during the fall/winter months and remission during the summer. The present study compared psychological differences between subclinical SAD and nondepressed (Control) individuals and the seasonal stability of these differences. Psychological characteristics that were assessed include explanatory style for negative outcomes (Stability, Globality , Self-worth Implications), coping styles in response to depressed mood (Rumination, Distraction, Problem-Solving, Dangerous Activities), personality style (sociotropy, solitude and independence), stress appraisal of winter stimuli, as well as response latency and immediate and delayed recall of SAD, Depressed, and Neutral words presented during a modified Stroop task. The results indicated that SAD individuals ruminated more than Control individuals during the winter; utilized more stable, global, and self-worth implicating (characterological) explanations; were more sociotropic; and exhibited a greater stress appraisal of winter stimuli. The sociotropy, stress appraisal of winter stimuli, and use of stable explanations in SAD individuals did not change with the seasons. During the summer, SAD individuals improved in their coping style (less rumination, more distraction and problem-solving) and explanatory style (less global and self-worth implicating explanations). The temporal stability of the stress appraisal of winter stimuli suggests the presence of a unique cognitive schema associated with seasonal mood changes.

INTRODUCTION

Although seasonal changes in mood and behavior have been recognized since the time of Hippocrates (Kane & Lowis, 1999; Rosenthal, Sack, James et al., 1985), the phenomenon has received serious research attention only within the last two decades. Seasonal Affective Disorder (SAD) is characterized by the regular onset and remission of depressive episodes that follows a seasonal pattern (Lee et al., 1998; Rosenthal et al., 1984). Two distinct types of SAD have been identified: summer SAD and winter SAD (Lee et al., 1998). Summer SAD refers to recurrent depressive episodes that begin during late spring or summer and remit in late summer or early fall. Winter depression refers to recurrent depressive episodes start in the fall or winter and remits during the spring or summer (Garvey, Wesner, & Godes, 1988; Magnusson & Boivin, 2003). The term SAD henceforth refers to winter SAD.

Characteristic features of SAD are as follows. First, there is a seasonal pattern to the depressive symptoms (seasonality; Lee et al., 1998). Research shows that SAD tends to onset between the months of September and November (Terman, 1988; Terman, Quitkin, Terman, Mcgrath, & Stewart, 1987). It tends to last approximately five months (Terman et al., 1987) with SAD individuals reporting a nadir in depressive moods between December and February (Terman, 1988; Terman et al., 1987). Research also shows that SAD tends to remit between the months of March and April (Terman, 1988; Terman et al., 1987).

A second characteristic feature of SAD is a cluster of somatic-vegetative symptoms including increased appetite, weight gain, and hypersomnia (Lam et al. 2001). The somatic-vegetative symptoms are often referred to as atypical symptoms because they tend to be opposite to the cluster of symptoms that typically manifest during nonseasonal depression: decreased appetite, weight loss, and insomnia. It is important to note that although atypical symptoms are

found to be higher in number and intensity in SAD relative to nonseasonal depression (Garvey, Wesner, & Godes, 1988), they are not unique to SAD and are found in other disorders such as the nonseasonal atypical depression (Stewart, Quitkin, Terman, & Terman, 1990).

Response to natural and artificial light is also considered characteristic of SAD (Lee et al., 1998). Epidemiological studies show the prevalence of SAD to range from 0.4% to 9.2% (Blazer, Kessler, & Schwartz, 1998; Mersch, Middendorp, Bouhys, Beersma, & Hoofdakker, 1999a) depending on latitude. Research consistently shows the prevalence of SAD to increase with northerly latitude (Lee et al., 1998; Mersch, Middendorp, Bouhys, Beersma, & Hoofdakker, 1999b; Sourander, Koskelainen, & Helenius, 1999; Suhail & Cohcrane, 1997; Terman, 1988). The shortened photoperiod during winter in northerly sites have led researchers to posit an etiological role of decreased light in SAD (Lee et al., 1998; Rosenthal & Wehr, 1987; Sakamoto, Nakadaira, Tamura, Takahashi, 1993; Terman, Reme, Rafferty, Gallin, & Terman, 1990).

The contention that decreased light may play a part in the pathogenesis of SAD is bolstered by the beneficial response that SAD individuals evidence to the therapeutic administration of bright artificial light (Terman et al., 1987). Light therapy is presently the most efficacious and rapid method of alleviating SAD symptoms (Partonen & Lundquist, 1998; Rosenthal & Wehr, 1987). It entails the daily administration of bright artificial light indoors. Antidepressant response to light therapy begins within three to four days of administration (Lee & Chan, 1999; Terman et al., 1990), with the possibility of relapse within the same period of time upon cessation of the therapy (Meesters et al., 1993; Terman, Terman, & Quitkin, 1989). Clinical response to light therapy can be reached within a week (Meesters, et al., 1993; Thase, 1989) with optimal gains after four weeks (Bauer, Kurtz, Rubin, & Marcus, 1994; Eastman, Young, Fogg, Liu, & Meaden, 1998; Terman et al., 1989).

Different assessment devices are associated with different prevalence and sex estimates. Studies that employ the Seasonal Pattern Assessment Questionnaire (SPAQ, Rosenthal, 1993) as the sole assessment device indicate that SAD is more prevalent among women than men (Jacobsen, Sack, Wehr, Rogers, & Rosenthal, 1987; Kane & Lowis, 1999; Kasper, Wehr et al., 1989; Lee et al., 1998; Mersch et al.1999b; Partonen & Lundquist, 1998; Rosenthal & Wehr, 1987; Terman et al., 1989). Yet, a more recent epidemiological study that employed *Diagnostic and Statistical Manual of Psychiatric Disorders Fourth Edition Text Revision* (DSM-IV TR, American Psychological Association, 2000) diagnostic criteria suggests SAD to be more prevalent among men than women (Blazer, Kessler, & Schwartz, 1998). It would appear that the predominance of women among SAD individuals disappear when clinical criteria are utilized.

Studies that use SPAQ to define SAD (e.g., Bartko & Kasper, 1989; Kasper, Wehr, Bartko, Gaist, & Rosenthal, 1989; Mersch et al., 1999a; Rosen et al., 1990) tend to yield higher prevalence rates relative to those that employ *DSM-IV TR* Seasonal Pattern criteria (Blazer et al., 1998), possibly because the use of nonclinical criteria would include subsyndromal SAD (S-SAD) as well as clinical SAD individuals. S-SAD is less impairing than SAD (Kasper, Wehr et al., 1989; Kasper, Rogers, Madden, Vanderpool, & Rosenthal 1989) and has a shorter and milder depressive episode (Kasper, Wehr et al., 1989; Kasper, Rogers et al., 1989; Lam, Tam, Yatham, Shiah, & Zis, 2001).

Distinctiveness of SAD: A Controversial Issue

Although SAD is generally treated as a depressive disorder distinct from nonseasonal depression in the research literature, the *DSM-IV TR* (American Psychiatric Association, 2000) currently refers to SAD as a Seasonal Pattern modifier of other mood disorders rather than as a distinct diagnostic entity. It has certain characteristics that differentiate it from nonseasonal

depression that include seasonality, atypical symptomatology, and phototherapeutic response. A succinct review of relevant literature on distinctions between SAD, nonseasonal depression, and to a lesser extent S-SAD is conducted below. It is important to note that although nonseasonal depression and S-SAD are discussed in the following section for explaining the purpose of the current study, SAD is nonetheless the sole focus of the study.

Distinctions Between SAD and Nonseasonal Depression

Seasonality. Seasonality has been described as SAD's "sole invariant defining characteristic" (Lee et al., 1998, p. 276). It refers to the seasonal change in mood, energy, sleep, appetite, food preference, and socialization pattern (Bauer & Dunner, 1993; Hardin, Wehr, Brewerton, & Kasper, 1991; Rosenthal, 1993; Sher, Goldman, Ozaki, & Rosenthal, 1999, Sher, 2001; Spitzer & Williams, 1989). Although originally thought to be unique to SAD (e.g., Rosenthal, 1989), it has been found in lesser degrees in other clinical disorders such as nonseasonal depression (Hardin et al., 1991) and bipolar disorder (Thompson, Stinson, Fernandez, Fine, & Isaacs, 1988) and in the general population (Kasper, Wehr et al., 1989).

It was subsequently argued that the *severity* of seasonality should be the feature that distinguishes SAD individuals from nonseasonal depressed individuals (Hardin et al., 1991; Magnusson, 1996; Thompson et al., 1988). Accordingly research has shown that SAD, bipolar, and nonseasonal nondepressed populations can be effectively distinguished based on the degree of seasonal variation in their depressive symptoms (Hardin et al., 1991; Thompson et al., 1988). Consequently, seasonality has been conceptualized as a single dimension that cuts across diagnostic lines with SAD individuals at one extreme end, S-SAD individuals at an intermediate position (Bauer, 1992) and completely nonseasonal individuals at the other extreme end (Bartko & Kasper, 1989; Bauer, 1992; Bauer & Dunner, 1993; Bauer et al., 1994; Jang, Lam, Harris,

Vernon, & Lively, 1998; Kasper, Rogers et al., 1989; Kasper, Wehr et al., 1989; Lam et al., 2001; Rosen et al., 1990; Sher, 2001; Young, Watel, Lahmeyer, & Eastman, 1991).

Symptomatology. The definition of seasonality involves the consideration of the seasonal changes in two general classes of symptoms: typical and atypical symptoms. Typical depressive symptoms (e.g., low mood, low concentration) are associated with nonseasonal depressive episodes (Garvey, Wesner & Godes, 1988; Lam et al., 2001; Young et al., 1991). Atypical symptoms (i.e., increased appetite, carbohydrate craving, hypersomnia,) are often present to a lesser degree or absent during a nonseasonal depressive episode (Allen, Lam, Remick & Sadovnick, 1993; Garvey et al., 1988; Meesters et al., 1993; Rosenthal et al., 1984; Sakamoto, Nakadaira, Kamo, Kamo, & Takahashi, 1995; Young et al., 1991).

Research shows that SAD depressive episodes tend to involve a higher severity of atypical symptoms than nonseasonal depressive episodes (Allen et al., 1993; Garvey et al., 1988; Lam et al., 2001; Meesters et al., 1993; Rosenthal et al., 1984; Sakamoto et al., 1995; Young et al., 1991). Nonetheless, it should be kept in mind that although atypical symptoms may be more frequently associated with SAD, they are not distinct to the disorder because individuals with nonseasonal atypical depression might also present with some degree of atypical symptoms (Stewart, Quitkin, Terman, & Terman, 1990; Thase, 1989).

Research shows that S-SAD individuals evidence similar levels of atypical symptomatology as SAD (Lam et al., 2001), and that the typical symptoms in SAD significantly outnumber the typical symptoms in S-SAD (Kasper et al., 1989a; Lam et al., 2001). These findings suggest that SAD may be better differentiated from S-SAD using typical symptoms as discriminators rather than atypical symptoms.

Phototherapeutic response. Several studies have been conducted using light therapy (i.e., photherapy) that is delivered through boxes that produce broadband white light. Response to light therapy was initially thought to be distinct to SAD individuals (Mackert, Volz, Stieglitz, & Orlinghausen, 1990; Stewart et al., 1990; Volz, Mackert, Stieglitz, & Muller-Orlingausen, 1990; Yerevenian, Anderson, Grota, & Bray, 1986). Some research shows that SAD responds better to light therapy than nonseasonal depression (Thalen, Kjellmanm Morkrid, Wilbom, & Wetterberg, 1995; Yerevenian et al., 1986), although one review suggests that nonseasonal depressed individuals show a rate and magnitude of response to light therapy that is comparable to those demonstrated by SAD patients (Kripke, 1998). A more recent meta-analysis (Golden et al., 2005) using only studies with randomized controlled trials showed that bright light therapy was effective in reducing depression symptom severity for both SAD and nonseasonal depression; however the effect size was greater for SAD (0.84) than for nonseasonal depression (0.53). Surprisingly, research shows that S-SAD has a better response to light therapy than SAD (Lam et al., 2001). This may be due to the higher ratio of atypical to typical ratio of symptoms in S-SAD than in SAD (Kasper, Rogers et al., 1989; Kasper, Wehr et al., 1989; Lam et al., 2001), a factor that has been found to predict better response to light therapy (Terman et al., 1996).

Interestingly, the general consensus among the few studies that have assessed typical and atypical symptoms is that the two classes of symptoms respond differently to light therapy (e.g., Lam et al., 2001; Lee & Chan, 1999; Terman, Amira, Terman, & Ross, 1996). For example, Lee and Chan (1999) applied a meta-analytical methodology to 39 studies on light therapy and SAD. Results showed that whereas typical symptoms evidenced a dose-response (i.e., typical symptoms intensity decreased as light intensity increased), atypical symptoms evidenced a constant phototherapeutic response regardless of light intensity. Researchers concluded that the

differential response to light therapy evidenced by atypical and typical symptoms reflected the agency of independent pathogenic mechanisms.

Pharmocotherapeutic response. Most pharmacotherapeutic research in SAD has focussed on serotonin-regulating pharmaceuticals because the somatic-vegetative symptoms are associated with serotonergic functioning (Wurtman, 1990). One study compared the efficacy of light therapy and a precursor to serotonin, tryptophan, in alleviating SAD symptoms. It revealed an equivalent response in SAD subjects to tryptophan and light therapy (McGrath, Buckwald & Resnick, 1990). Results also showed a trend towards greater remission of atypical symptoms in l-tryptophan than light therapy. Problems with the study include a small sample size (N=13), the possibility of crossover effects, and sub-optimal l-tryptophan treatment durations. Presently, no study has explicitly compared the effect of tryptophan therapy on SAD and nonseasonal depression.

Other studies have assessed therapeutic effects of selective serotonin re-uptake inhibitors (SSRI, Lam et al., 1995; Partonen & Lundqvist, 1996; 1998; Ruhrmann et al., 1998) and on SAD. Results revealed equivalent response between light therapy and fluoxetine. Results also showed that compared to typical symptoms, atypical symptoms responded more rapidly to fluoxetine than to light therapy. Furthermore, one study designed to assess pharmacotherapeutic effects of the catecholaminergic and dopaminergic regulating antidepressant moclobemide on SAD (Partonen & Lonnqvist, 1998) showed moclobemide to alleviate SAD to an equivalent degree to fluoxetine. Preliminary research concerning pharmacotherapy suggests that future research would benefit from examining atypical and typical symptomatic response separately given the possibility that they may reflect disparate pathogenic mechanisms (Lam et al., 2001; Lee & Chan, 1999; Sher, 2001; Terman et al., 1990; Young et al., 1991).

Conclusions on the Distinctiveness of SAD's Characteristic Features

Research suggests that SAD differs from nonseasonal depression in two ways. First, SAD is associated with a higher degree of seasonal change in atypical symptoms compared to nonseasonal depression. Second, SAD is associated with a higher degree of phototherapeutic response compared to nonseasonal depression.

A noteworthy point is that because research shows most individuals to experience seasonal change in mood and behaviour to some degree, it may be beneficial to assess human functioning on a single continuous dimension referred to as seasonality (Bartko & Kasper, 1989; Bauer, 1992; Bauer & Dunner, 1993; Bauer et al., 1994; Jang et al., 1998; Kasper, Rogers et al., 1989; Kasper, Wehr et al., 1989; Lam et al., 2001; Rosen et al., 1990; Sher, 2001; Young et al., 1991). The seasonality continuum is composed mainly of atypical symptoms characteristic of SAD including increased sleep, increased appetite, carbohydrate craving (Bauer, 1992), and fatigue (Young et al., 1991). The findings that SAD shows a higher degree of seasonal change in atypical symptoms and respond better to phototherapy relative to nonseasonal depression corroborate the concept of the seasonality dimension and the view that SAD is different from nonseasonal depression.

Etiological Models of SAD

Given that the distinctive characteristic in SAD is the seasonal nature of its depressive episodes, most etiological models have posited a biological factor in the presence of decreased exposure to sunlight during the winter months when the photoperiod is shorter (James, Wehr, Sack, Parry, & Rosenthal, 1985; Lee et al., 1998; Lee & Chan, 1999; Meesters et al., 1993; Moller, 1992; Rosenthal et al., 1988). Biological models of SAD include the Melatonin Hypothesis (Rosenthal et al., 1985), the Phase Shift Hypothesis (Lee at al., 1998; Lewy, Miller,

& Hoban, 1987; Meesters et al., 1993; Murray, Nicholas, & Trinder, 2003), the Photon Counting Hypothesis (James et al., 1985; Lee et al., 1998; Lee & Chan, 1999; Rosenthal et al., 1985), and the Serotonin Hypothesis (Lee et al., 1998; Moller, 1992; Rosenthal et al., 1984; Wurtman, 1990). Equivocal evidence exists for all of these explanations and a review of them is beyond the scope of this paper. Interested readers are referred to the aforementioned works for more information.

The commonality among all the biological models is their position that the combined interaction between decreased exposure to sunlight (that occurs during fall and winter) and an underlying biological mechanism is both necessary and sufficient to account for the characteristic features in SAD. Biological models posit a pathogenic biological factor to be necessary to induce a SAD depressive episode during the decreased photoperiod in winter. Therefore the biological paradigms would predict that the atypical and typical symptoms of SAD would onset and remit at approximately the same time, respond similarly to light therapy, and positively correlate in magnitude (i.e., as one type of symptom increases the other would increase as well).

Research comparing SAD, S-SAD, and nonseasonal depression have revealed multiple findings that are incompatible with the biological paradigms. For example, if a pathogenic biological mechanism (during a seasonal decrease in photoperiod) induces both typical and atypical symptoms, then both classes of symptoms should show some relation in temporal onset, phothotherapeutic response, and magnitude, but such is not the case. Rather, research shows that the typical and atypical symptoms are temporally unrelated in both onset and remission (Partonen & Londquist, 1998; Rosenthal et al., 1984; Young et al., 1991), show differential response to light therapy (Lee & Chan, 1999), and are uncorrelated in magnitude (Terman et al.,

1990). Such findings suggest that the typical and atypical symptoms may be served by different mechanisms (Lam et al., 2001; Lee & Chan, 1999; Young et al., 1991) rather than by one as posited by traditional biological models.

The Dual-Vulnerability Hypothesis (DVH) hypothesizes SAD to be the result of two pathogenic processes, rather than a single pathogenic biological process (Lam et al., 2001; Young et al., 1991). More specifically, the DVH posits that SAD is the result of a vulnerability to both seasonality (e.g., a pathogenic biological mechanism during decreased exposure to light) and depression (e.g., depressogenic cognitive patterns). Both factors are characterized as dimensional trait vulnerabilities (Lam et al., 2001). The typical symptoms in SAD are hypothesized to develop from psychological vulnerabilities coupled with distress arising from either the anticipation or the experience of the atypical symptoms (i.e., energy, weight, and sleep disturbance) as stressful (Lam et al., 2001; Young et al., 1991). In contrast, the atypical symptoms are thought to arise from seasonality that occurs due to a pathogenic biological mechanism during the decreased photoperiod of fall/winter (Lam et al., 2001; Young et al., 1991). Thus, the DVH anticipates the typical symptoms to commence with the onset of fall/winter and the typical symptoms to appear either before (in anticipation of) or after (in reaction to) atypical vegetative symptoms (Lam et al., 2001; Young et al., 1991). This temporal relationship is one that cannot be accounted for by biological models.

The DVH also offers explanations for research showing equivalent degree of atypical symptoms reported by individuals with SAD and S-SAD (Lam et al., 2001) for which biological models cannot explain. Given that biological models posit a biological factor to account for the SAD depressive episode (Lee et al., 1998), and that SAD is conceptualized to be a more severe version of S-SAD (Bauer, 1992), it follows that SAD should evidence both more typical and

atypical symptoms than S-SAD. Yet, research shows that the degree of atypical symptoms are equivalent in SAD and S-SAD populations (Lam et al., 2001) instead of the atypical symptoms being relatively more pronounced in SAD than S-SAD populations as would be predicted by a biological model (Bauer, 1992; Bauer & Dunner, 1993). The DVH can account for this finding.

Lam and colleagues (2001) extended the DVH by suggesting that an individual's degree of vulnerability to both the seasonality and depression dimensions will determine an individual's symptomatological intensity and clinical status. For example, whereas an individual with high seasonality and low depressogenic tendencies will generally experience S-SAD, an individual with high seasonality and at least intermediate depressogenic tendencies will likely experience SAD (Lam et al., 2001; Thase, 1986; Young et al., 1991). As the DVH posits that atypical symptoms are associated with seasonality (due to a biological pathogenic mechanism), and that both SAD and S-SAD load high on this seasonality factor (Young et al., 1991), the DVH would predict that SAD and S-SAD would be associated with the seasonality factor's atypical symptoms. Hence the DVH provides a better account than biological models for the equivalent degree of atypical symptoms in SAD and S-SAD.

Lam and colleagues (2001) further posited that SAD is different from S-SAD in its greater degree of vulnerability to depression. Hence, S-SAD would not be expected to develop the typical symptoms of depression severe enough to warrant a clinical diagnosis because S-SAD has no, or little loading on the depression vulnerability dimension. In contrast, because SAD is associated with a higher degree of depression vulnerability, SAD individuals are expected to develop typical depressive symptoms in the context of stress from the atypical symptoms.

The DVH posits that individuals who are vulnerable to depression develop the typical symptoms that are associated with nonseasonal depression (Young et al., 1991). Lam and

colleagues (2001) proposed that compared to SAD individuals, nonseasonal depressed individuals load higher on the depression factor with little or no contribution from the seasonality dimension. Accordingly, SAD is associated with relatively milder typical symptoms than is usually associated with nonseasonal depression (Allen et al., 1993; Thalen et al., 1995).

Research suggests that psychological factors such as ruminative coping style (Just & Alloy, 1997; Nolen-Hoeksema, 1991; Nolen-Hoeksema, Morrow, & Frederickson 1993; Rohan, Sigmon, & Dorhofer, 2003) and negative explanatory styles (Alloy et al., 1999) may be psychological vulnerabilities in nonseasonal depression. Given that the DVH posits that SAD is associated with a higher loading on the depression dimension than nonseasonal nondepressed (Control) individuals, it is possible that SAD would be associated with higher levels of depression vulnerability traits compared to Control individuals even when SAD individuals are in their remission period. This prediction that has significant implications for illuminating the distinctiveness and etiology has yet to be fully addressed in the psychological literature of SAD.

Psychological Factors in SAD

Single-continuum biological paradigms that have guided SAD research since its initial conceptualization have resulted in a relative neglect of psychological factors in SAD. Most of the research has focussed on the light and biological aspects of SAD (Lee et al., 1998). This oversight is unfortunate considering that psychological distinctions are as important as neurobiological distinctions for SAD to be differentiated from S-SAD and nonseasonal depression (Bauer & Dunner, 1993) and that psychological factors may play a part in the etiology of SAD (Lam et al., 2001; Young et al., 1991).

Psychological factors that are associated with nonseasonal depression have been found to bear a relationship to SAD as well (Geerts et al., 2000; Hodges & Marks, 1998; Levitan, Rector,

& Bagby, 1998; Lingjaerde, Foreland, & Engvik, 2001; Schuller et al., 1993; Wrzecionek, 2000). A succinct review of extant research on psychological factors in SAD is conducted below and implications for psychological distinctiveness and the etiological role of psychological factors are discussed in succeeding sections. Future research is highlighted from the discussion.

Beck (1976) posits that depression is an exaggerated and persistent form of sadness that results from interpretive structures referred to as schemas. Schemas vary in content and valence across disorders (Beck & Perkins, 2001) and individuals with different personality styles (Coyne & Whiffen, 1995). Schemas are theorized to remain dormant outside of a depressive episode until activated by stressors that match the content of the depressed individual's schema (Beck, 1976; Beck, Rush, Emery, & Shaw, 1979). Beck (1976) theorized that once activated, depression schemas invoke a systematic bias to interpret, store, and retrieve information about the self, the future, and the world in a negative manner (Beck, 1976). Active schematic processing renders the cognitive "products" (Beck & Perkins, 2001) of depression that include automatic thoughts, dysfunctional attitudes, negative explanatory style, and rumination (Beck, 1976; Beck & Perkins, 2001; Beck, Rush, Emery, & Shaw 1979). Explanatory style and rumination have been assessed in SAD and nonseasonal depression via self-report measures (Dew & Tan, 2003; Levitan, Rector, & Bagby, 1998; Wrzecionek, 2000). Research related to the different psychological factors associated with depression and potentially SAD is discussed below. The factors include explanatory style, coping style, personality style, and cognitive schematic content.

Explanatory Style

Explanatory style refers to a dispositional (Abramson, Metalsky, & Alloy, 1989; Peterson & Seligman, 1984) tendency to attribute outcomes to factors in a certain fashion (e.g., Abramson et al., 1989; Hilsman & Garber, 1995; Joiner, 2001; Ralph & Mineka, 1998). It is typically

conceptualized as consisting of three attributional (causal) dimensions: internal/external, global/specific, and stable/unstable (Abramson et al., 1989; Hilsman & Garber, 1995; Joiner, 2001; Ralph & Mineka, 1998). A negative explanatory style refers to a dispositional tendency to explain negative life events that implicates internal, stable, and global factors.

There is ample research (e.g., Abramson et al., 1989; Peterson & Seligman, 1984) to indicate that depressed individuals ascribe to a negative explanatory style which in turn ensures that the depression is maintained or sometimes exacerbated. The explanatory style affects the intensity and duration of a depressive episode. More specifically, individuals who employ an internal, stable and global explanatory style are vulnerable to experiencing a lengthy and severe depressive episode (Abramson, Garber, & Seligman, 1980; Abramson et al., 1989; Abramson & Martin, 1981; Abramson, Seligman, & Teasdale, 1979). A prospective study found that among the never-depressed, those who use a more negative explanatory style are more likely to experience a first episode of depression than those with a less negative explanatory style even when levels of depression were controlled for (Alloy et al., 1999). Further, research has shown that negative explanatory style remains negative after remission from nonseasonal depression (Eaves & Rush, 1984; Gotlib, Lewinsohn, Seeley, & Rhode, 1993)

Levitan, Rector, and Bagby (1998) assessed the explanatory style of 26 SAD and 30 nonseasonal depressed individuals. Results revealed that individuals with SAD and nonseasonal depression did not differ in a composite explanatory score composed of globality and stability explanatory scales of the Attributional Style Questionnaire. However, group differences on each dimension might have been masked because the statistics were reported on a composite score of globality and stability. Furthermore, the dimension of internality was not measured. This is a critical oversight given that SAD is related to an external factor (change in seasons) whereas

nonseasonal depression is often attributed by the depressed individuals themselves to an internal reason (e.g., defective self).

Dew and Tan (2003) therefore assessed the separate explanatory dimensions in SAD, S-SAD, nonseasonal depressed, and nonseasonal nondepressed individuals. Results revealed that SAD individuals endorsed a more global and stable explanatory style relative to S-SAD. The internal dimension did not differ between groups. Dew and Tan proposed that a more worthwhile distinction to consider might be the concept of characterological versus behavioural flaw where nonseasonal depressed individuals might view themselves as defective and unworthy (internal characterological) while SAD individuals might see themselves as failing to engage in sufficient physical exercise or get sufficient sunlight (internal behavioural).

The studies above assess the SAD individuals while they were in their depressive states. Whether the results would hold during their remission period is unknown.

Coping Style

Coping style might be described as a dispositional and stable (trait-like) type of response to stressful events, or in this case, to depressive moods (Just & Alloy, 1997; Nolen- Hoeksema, 1991; Nolen-Hoeksema, Morrow, & Frederickson 1993; Rohan, Sigmon, & Dorhofer, 2003). Research generally shows that how one copes with a depressive mood has different implications for the intensity and duration of that depressive mood (Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema, 1987; 1991; Nolen-Hoeksema et al., 1993)

Nolen-Hoeksema's response styles theory contends that ruminative coping has specific implications for both the duration and the severity of a depressive episode (Lyubormirsky & Nolen-Hoeksema, 1999; Nolen-Hoeksema, 1987; 1991; Rusting & Nolen-Hoeksema, 1998). Ruminative coping refers to the use of cognitions and behavior that focus one's attention on

possible causes and consequences of one's depression and on one's depressive symptomatology (Nolen-Hoeksema, 1987; 1991; Nolen-Hoeksema et al., 1993). The response styles theory also recognizes other coping styles that include distraction, problem solving, and dangerous activities. Distractive coping refers to the use of cognitions and behaviors that distract one's focus from possible causes and consequences of one's depression or from one's depressive symptomatology through engagement in pleasant or neutral activities (Nolen-Hoeksema, 1987; 1991; Nolen-Hoeksema et al., 1993). Problem-solving refers to the tendency to generate and engage in possible solutions to a given problem (Nolen-Hoeksema, 1987; 1991). Dangerous activities coping style refers to the tendency to engage in reckless or impulsive activities that are maladaptive and may result in negative consequences for the individual's health and functioning (Nolen-Hoeksema, 1987, 1991).

Wrzecionek (2000) assessed the coping styles of 17 SAD, 17 nonseasonal depressed, and 17 nondepressed individuals. Results revealed that SAD and nonseasonal depressed individuals both endorsed significantly more rumination relative to nondepressed individuals. There were no differences among the three groups on distractive, problem-solving, and dangerous activities coping styles. The absence of significant differences may have been due to a small sample size.

Dew and Tan (2003) assessed 32 SAD, 31 S-SAD, 20 nonseasonal depressed, and 25 nondepressed individuals in their coping styles. Results revealed that SAD individuals ruminated significantly more than the nonseasonal depressed individuals, who in turn ruminated more than the S-SAD and nondepressed individuals. Results further revealed that those with SAD reported engaging in more dangerous activities relative to their S-SAD and nondepressed counterparts. However, the cross-sectional design of the study prohibited the assessment of whether the findings would persist into the remission period of these individuals.

Rohan, Sigmon, and Dorhofer (2003) assessed 18 SAD and 20 age-matched Controls in their ruminative coping frequency both during the winter (and therefore during a depressive episode) and during the summer or fall (outside of the depressive episode). Results revealed that SAD individuals endorsed rumination more than did the Control individuals, and that fall rumination predicted winter depressive symptoms when the fall depressive symptoms were statistically controlled for. The authors suggested that rumination represented a cognitive vulnerability as posited by the Dual Vulnerability Hypothesis. However, only female subjects were assessed and therefore the generalizability of findings to males is unknown.

Personality Style

Two personality styles, sociotropy and autonomy, have been widely implicated in depression (e.g., Beck, Epstein, & Harrison, 1983; Coyne & Whiffen, 1995; Nietzel & Harris, 1990; Persons, Miranda, & Perloff, 1991; Pilkonis, 1988; Weishaar & Beck, 2006). Sociotropy, also known as social dependency, refers to a stable complex of beliefs, attitudes, and goals that motivate individuals to seek out positive relations with others (Bagby et al., 2001; Beck et al., 1983; Dozois & Backs-Dermott, 2000). Sociotropic individuals believe that the attainment of interpersonal conditions such as social acceptance and approval are necessary for self-worth (Bagby et al., 2001; Beck et al., 1983; Dozois & Backs-Dermott, 2000). Sociotropic individuals tend to fear adverse social conditions such as rejection, isolation, and derision. In contrast, autonomy, also known as individuality, refers to a complex of beliefs, attitudes, and goals that motivate an individual to seek out independence and achievement (Beck et al., 1983; Dozois Backs-Dermott, 2000), both of which are necessary for their self-worth. Autonomous individuals tend to fear situations such as failure. Both interpersonal and achievement conditions are

theorized to trigger nonseasonal depression when a stressor matching either schema in content manifests in a depression-prone individual's life (Beck et al., 1983).

Although research broadly supports the validity of the sociotropy construct (Allen & Trinder, 1996; Beck, Robbins, Taylor, & Baker, 2001; Dozois & Backs-Dermott, 2000; Robins, Block, & Peselow, 1989; Toru & McCaan, 2000), the validity for the autonomy construct is lacking (Allen & Trinder, 1996; Beck, Robbins, Taylor, & Baker, 2001; Dozois & Backs-Dermott, 2000; Robins et al., 1989; Sato & McCaan, 2000). For example, the Sociotropy subscale of the Sociotropy-Autonomy Scale (SAS; Beck et al., 1983) evidences good convergent validity as it correlates highly with the Dependency scales included on other measures, whereas the Autonomy subscale of the SAS evidences poor convergent validity with other scales measuring similar constructs (Blaney & Kucher, 1991; Gorski & Young, 2002; Rude & Burnham, 1993). Poor convergent validity has led researchers to question both the validity and the utility of the autonomy construct (Allen, Horne, & Trinder, 1996; Blaney & Kucher, 1991; Dozois & Backs-Dermott, 2000) as a vulnerability factor in nonseasonal depression. In contrast, consistent relations between sociotropy (or interpersonal dependence) and nonseasonal depression in the research have led some researchers to suggest that interpersonal matters are relevant in nonseasonal depression (Dozois & Back-Dermott, 2001; Joiner, Coyne, & Blalock, 1999; Sacco, 1999). Research has yet to address the stability of sociotropy in either nonseasonal depressed or SAD individuals across their depressive and remission periods.

Cognitive Schematic Content

Preliminary research suggests the presence of a winter-related schema in SAD. Dew and Tan (2003) assessed the self-reported dread of winter and the negative affective reactions to winter stimuli in SAD, S-SAD, nonseasonal depression, and nondepressed individuals. Results

showed that SAD individuals endorsed a higher degree of dread of winter relative to the other three groups, who in turn, did not differ among themselves. SAD individuals further endorsed significantly more negative affective reaction to winter stimuli relative to other groups. These findings need to be measured outside of the depressive episode to ensure their reliability and validity.

Results from the Dew and Tan (2003) study suggested that SAD individuals find winter to be stressful, whereas such is not the case for those with S-SAD or nonseasonal depression. Therefore, one psychological characteristic that distinguishes SAD from nonseasonal depression may reside in winter-related cognitive schematic content. However, the findings were based on retrospective self-reports and may be affected by recall biases. One way to ensure the reliability and validity of Dew and Tan's results would be to prospectively assess the self-reported dread of winter both within and outside of the depressive episode. If the dread of winter persists across both periods, then confidence in the idea that SAD is associated with a specific schema would be bolstered. Another way would be to employ an objective measure of cognitive schematic content such as the modified Stroop test.

The modified Stroop task is a prototypical information-processing task that is used to assess schematic cognitive content of clinical populations while simultaneously avoiding biases associated with self-report measures (Kindt, Bierman, & Brosschot, 1996; Spinks & Dalgleish, 2001). The modified Stroop task procedure is a modification of the original Stroop task. The original Stroop task procedure requires individuals to name the colour in which a word was presented, while simultaneously ignoring the semantic content of the word. Results tended to show that colour words (e.g., the word "blue") were associated with longer response latencies relative to non-colour words (e.g., the word "bicycle"). Researchers suggested the increased

response latency to result from interference between the colour-related semantic content of the word with the colour-naming task.

The modified Stroop task procedure also requires individuals to colour-name the presented word stimuli. However, it differs from the original Stroop task in that it manipulates the semantic content of word stimuli such that words related to an individual's cognitive concerns (e.g., the word "sad" for a depressed individual) are compared to words irrelevant to the cognitive concerns (e.g., the word "pencil" for a depressed individual). Results have shown that depressed individuals evidence a delayed response latency for depression-related words relative to nondepression words, whereas this difference tends to be attenuated for nondepressed individuals (Williams, Matthews, & MacLeod, 1996)

Gotlib and McCann (1984) conducted the initial study to assess depressed individuals' performance on the modified Stroop task. Researchers assigned university students to either depressed or nondepressed groups in accordance with their Beck Depression Inventory scores (BDI, Beck, Ward, Mendelson, Mock, & Erlbaugh, 1961). Both depressed and nondepressed groups were required to name the colour of neutral, manic, and depression-related words. Results showed that depressed individuals evidenced longer response latencies for depression words compared to manic and neutral words. In contrast, nondepressed individuals' response latencies were uniform across word types. Confirmatory findings of response latency for depression-related words have been extended to depressed females (Williams & Nulty, 1986), dysphoric populations (Gilboa & Gotlib, 1997) and clinically depressed populations (Gotlib & Cane, 1987).

The modified Stroop effect in depressed populations has not always been supported in the research however. Hedlund and Rude (1995) found no Stroop effect indicative of selective processing in a sample of clinically depressed individuals. Explanations that have been invoked

to explain discrepant Stroop task findings include process-specificity effects and content specificity effects.

Process-specificity effects. Some researchers posit that different emotions are associated with different information processing anomalies (Bradley, Mogg, Mill, & White, 1995; Mogg & Bradley, 1999; Williams et al., 1996). Process-specificity theorists posit that anxiety is associated with a recognitional attention bias seen in the Stroop task, whereas depression is associated with an active recall bias. It is therefore possible that comorbid anxiety can account for the interference evidenced by depressed individuals.

Content specificity effects. Another possibility that may account for discrepant findings bears on the differences across studies in the congruency of the presented word stimuli. Congruency refers to the relevance of the presented word stimuli to the participant's cognitive concerns. A common finding is that the more relevant a word stimulus is to the specific cognitive content of a participant's depression schema, the more likely a delayed response latency will be seen in the modified Stroop task, whereas an irrelevant word stimulus may not invoke a delayed response latency (Bryant & Harvey, 1995; Dalgleish & Spinks, 2001; Williams et al., 1996). Accordingly, research shows that panic disorder individuals evidence a more delayed response latency to words related to somatic distress words and feared consequences of somatic distress compared to other negative words (Matthews & McLeod, 1994; McNally, Riemann, Juoro, & Lukach, 1992). For example, Mathews and Klug (1993) had individuals who were diagnosed with various anxiety disorders (i.e., Generalized Anxiety Disorder, Panic Disorder, and Social Phobia) colour-name words that were either unrelated or related to the cognitive content of Anxiety Disorders and were either positive or negative in valence. Hence words with a negative valence could be either related or unrelated to the cognitive content of Anxiety Disorders and the

same would hold for words that carry a positive valence. Anxiety Disorder individuals evidenced delayed response latency to words that were related to the cognitive content of Anxiety Disorders, irregardless of word valence (Mathews & Klug, 1993). Similar findings have been identified for PTSD and hypochondriacal populations and their coinciding cognitive concerns (Bryant & Harvey, 1995; Lecci & Cohen, 2002).

However, the research body of literature concerning the modified Stroop task in depression has been broadly criticized for being based on word stimuli that have been chosen in an unreliable and possibly invalid manner (Davies, 1997). More specifically, researchers have tended to choose word stimuli that they subjectively determine to be representative of their study's depressed group. However, it needs to be kept in mind that words irrelevant to the cognitive content of the subjects, even if negative or threatening in general, may be associated with shorter response latency relative to words that are directly related to the cognitive concerns (Williams et al. 1996). It is unclear whether only one or two individuals could compile a body of words that reliably and validly represent the depression experience. The possibility therefore arises that inconsistent Stroop task findings in depressed populations, in part, may be a function of the subjective manner in which the word stimuli have been chosen in the past. Future research may benefit from choosing word stimuli in an objective, reliable, and therefore more valid method than has been done in previous studies to ensure that the word stimuli content are congruent to the concerns of the studied population.

Modified Stroop task findings suggest a SAD relevant schema. A SAD-related schema has received support from modified Stroop task research. Dalgleish and Spinks (2001) assessed 21 SAD individuals on their response latency to "negative" words, "neutral" words, a string of zeroes (0000000), and "season-relevant" words during both winter and summer (i.e., during

depressed episode and outside the depressed episode). They found that SAD individuals were slower to colour-name both season-relevant words and negative words relative to both neutral words and zeroes both during winter and summer. The results suggest that season words are congruent to the cognitive content of SAD individuals as posited by the DVH (Lam et al., 2001; Young et al., 1991). Yet, results must be understood in the context of the following considerations. First, only five words were employed for each word type which may compromise the reliability and validity of the results. Second, the Stroop task was conducted manually and may be subjected to more errors in measurement relative to computerized Stroop task procedures. Third, some words employed in the modified Stroop task were not solely season-relevant but also were relevant to the depression experience in general (e.g., the word "sleep"). The Stroop task findings needs to be replicated with a computerized version, with a greater number of word stimuli and with season-relevant (i.e., SAD) words that do not overlap with the general depression experience. Nonetheless, self-report and Stroop task results taken together suggest that SAD individuals may have a cluster of beliefs and attitudes pertaining to the seasons that may invoke longer response latency to season-relevant words relative nonseasonal nondepressed individuals. This prediction remains unaddressed in the literature.

Recall Task

A second task that can assess specific schematic cognitive content of clinical populations while simultaneously avoiding the biases associated with self-report measures is the free recall task. In a free recall task, individuals are presented with a group of words and are asked to recall at a later time as many of the previously presented words as they can. Beck (1967) proposed that clinical populations have specific cognitive schemas that, once activated, guide information processing functions including memory. In particular, it is theorized that clinical populations

evidence better free recall for words congruent to the cognitive content of their particular disorder (Beck, 1972). For example, Beck and colleagues (1979) proposed that nonseasonal depression individuals are characterized by negative schemas regarding the self, others and the world. Accordingly, schematic memory function is reflected in the well-established finding that nonseasonal depression individuals are more likely than nondepressed individuals to correctly recall negative words related to nonseasonal depression schemas including negative adjectives regarding the self (for a review, see Williams, Watts, MacLeod, & Mathews, 1997). Likewise, research shows that eating disorder populations evidence a memory bias for words related to eating disorder themes such as fatness (Sebastian, Williamson, & Blouin, 1996), food and weight related words (King, Polivy, & Herman, 1991) and weight and shape related words (Hunt & Cooper, 2001). Further evidence for the content-specificity hypothesis comes from research that shows that although individuals with psoriasis were better than healthy individuals in their recall of words that were semantically-related to the condition of psoriasis, they evidence no significant difference from healthy individuals in their free recall of negatively emotional words either relating to the self or the reaction of others, and for neutral words (Fortune et al., 2003).

Research has failed to reliably reveal a negative memory bias for threat-related in stimuli in anxiety populations (Mathews & MacLeod, 1987; Mathews, Mogg, May, & Eysenck, 1989; Mogg, Mathews & Weinman, 1987; Williams, Wayys, MacLeod, & Mathews, 1988). The process-specificity model was invoked to explain how anxiety populations tend to contradict the content-specificity schema hypothesis by evidencing no recall bias for word stimuli that are purported to be to congruent to Anxiety Disorder cognitive concerns. More specifically, process-specificity theorists contend that anxiety is associated with an attentional bias towards areas of anxiety cognitive concern, but that anxiety individuals engage in cognitive avoidance of anxiety-

related material which results in the limitation of those resources that are necessary for the elaborative encoding that would otherwise enhance free recall of cognitive content related material (Mathews & MacLeod, 1987; Mathews, Mogg, May, & Eysenck, 1989; Mogg, Mathews & Weinman, 1987; Williams, Wayys, MacLeod, & Mathews, 1988). However, process-specificity theorists contend that nonseasonal depression individuals engage in elaborative encoding of nonseasonal depression schematic congruent material which enhances free recall of cognitive content related material (Mathews, Mogg, May, & Eysenck, 1989; Mogg, Mathews & Weinman, 1987; Williams, Watts, MacLeod, & Mathews, 1988). Hence, anxiety individuals show content specificity for the modified Stroop task but little free recall specificity, whereas nonseasonal depression evidence content specificity on free recall tasks.

One study has assessed free recall tendencies in SAD. Dalgleish and colleagues (2004) assessed recall for negative self-referential words in two studies. Results showed there to be no significant differences between SAD and never-depressed individuals in both studies. These researchers discussed the possibility of an absence of dysfunctional schemas in SAD to explain the nonsignificant differences in free recall between SAD and never-depressed individuals. However, another possible explanation for the nonsignificant differences may be that the researchers did not assess free recall tendencies for season-related (i.e., SAD) words. That is, given that research suggests that SAD may be associated with a season-related schema (Dew & Tan, 2003; Spinks & Dalgleish, 2001), it is possible that free recall differences may be evident between SAD and nondepressed individuals for words that are semantically congruent with such a season-related schema. This possibility remains to be addressed.

Conclusions on Psychological Factors in SAD

The DVH posits that both SAD and nonseasonal depression load on the depression dimension (e.g., explanatory style, rumination, dysfunctional thoughts). Not surprisingly, research shows that SAD is similar to nonseasonal depression in some aspects of its psychological profile during the depressive episodes. Both SAD and nonseasonal depressed individuals ascribe to a negative explanatory style for negative outcomes. However, some differences were observed as well. Those with SAD used rumination and engagement in dangerous (risky and/or impulsive) activities to a greater degree than their counterparts with nonseasonal depression. SAD individuals have also reported greater sensitivity to winter stimuli (winter stress) as exhibited in self-reports of negative reactions to winter, and in longer response latency to season-relevant words in a modified Stroop test. This suggests the possible presence of cognitive schema in SAD that is characterized by winter-related cognitive contents. Sociotropy has been linked to nonseasonal depression but its relevance to SAD has not been determined. While studies have found negative explanatory style to persist during remission in nonseasonal depression (Eaves & Rush, 1984; Gotlib et al., 1993), research has yet to explicitly address whether the same would be seen in SAD during remission periods. This would determine whether the various aspects of the psychological profile in SAD and nonseasonal depression are mood-dependent or whether they are more stable and represent a pattern of cognitive vulnerability.

The Present Study

The present study examined the psychological differences between subclinical SAD and Control (nonseasonal nondepressed) individuals and their seasonal stability over two times of assessment, winter (Time 1) and summer (Time 2). Both groups were examined for their

explanatory style, coping style to depressed mood, personality style, and cognitive schematic content. Cognitive schematic content was assessed with a self-report measure on winter stress and two objective tasks, the explicit recall task and the modified Stroop task. In the explicit recall task, the groups were assessed for their accuracy in immediate and delayed recall of three different word lists (depression words, SAD or season-related words, and neutral words). In the modified Stroop task, the groups were examined for their response latency to the same three word lists. More detailed description of these tasks can be found in the Method section that follows.

The participants were classified during the winter into one of two groups: subclinical SAD (high seasonality and high depression) and Control (low seasonality and low depression). Both groups were tested twice. The first occurred during the winter (Time 1) when the subclinical SAD group (henceforth referred to as the SAD group for brevity) was in its depressive episode (high depression symptom severity) and the second took place during the summer (Time 2) when the SAD group was outside of its depressive episode (low depression symptom severity). The Control group was nondepressed during both testings. All participants completed self-report measures and undertook both the modified Stroop task and recall tasks in both testing periods. The stimuli for the Stroop task were three lists that contained words which were depression-relevant, SAD (i.e., season) –relevant, and neutral. To partial out verbal intelligence that could affect performance on the modified Stroop test, all participants in the study were assessed for their degree of verbal intelligence prior to the Stroop assessment.

The following sets of hypotheses were made:

1. The SAD group would be associated with a more negative explanatory style (i.e., more stable, global, and internal-characterological) in comparison to the Control group both

during winter and summer. The SAD group would decrease in negative explanatory style from winter to summer.

2. The SAD group would endorse higher rumination during both winter and summer in comparison to the Control group. The SAD group would decrease in rumination from winter to summer.
3. The SAD group would be associated with more Sociotropy in comparison to the Control group both during winter and summer. The SAD group would decrease in Sociotropy from winter to summer.
4. Compared to the Control group, the SAD group would report higher dread of winter, more stress and impairment from atypical symptoms associated with the SAD depressive episode, report more rumination about winter stimuli, as well as more negative affect associated with winter stimuli during both the winter and the summer. These differences would remain stable across seasons.
5. Compared to the Control group, the SAD group would evidence a longer response latency to both SAD and Depression words during winter, but have a longer response latency only to SAD words during summer.
6. The SAD group would be associated with higher recall of SAD words on both the immediate and delayed recall tasks in comparison to the Control group both during winter and summer.

Method

Participants

A total of 203 individuals between the ages of 18 to 55 were recruited for the study during the winter from Lakehead University's Introductory Psychology classes. Of these, 28 who

met the SAD group criteria and 26 who met the Control group criteria were invited to participate in the winter session. Of these, 14 individuals (8 SAD and 6 Control) did not return for the summer session because they had relocated out of the city. This resulted in 40 participants (20 SAD, 20 Control) who completed both winter and summer sessions. The attrition rate was 25.93%. Detailed information on the composition of the sample can be found in a later section entitled *Sample Characteristics* on page 52.

Classification

The assessment and criteria for classification of the participants (see Table 1) were guided by research in the literature and the *Canadian Consensus Guidelines for the Treatment of Seasonal Affective Disorder* (Lam & Levitt, 1999). Classification of participants into groups was conducted during the winter. The SAD group endorsed a high score of 22 or more on the Hamilton Depression Rating Scale with the addendum atypical symptoms (HDRS-29, Williams, Link, Rosenthal, & Terman, 1988; see Appendix 1). The Control group endorsed minimal to no depressive symptoms (HDRS-29 < 14).

The SAD group also endorsed a high seasonality score, as indicated by five criteria on the Seasonality Screening Questionnaire (SSQ, see Appendix 2): (a) a Global Seasonality Score (GSS) of 12 or greater; (b) at least moderate seasonal impairment; (c) seasonal pattern to the depression symptoms with remission during the summer (July and August); (d) a seasonal pattern that was evident in the previous two years; and (e) absence of seasonal stressor that can account for the seasonal depressive episodes. In contrast, the Control group endorsed a low seasonality score as defined by (a) GSS <8; (b) no or only mild seasonal impairment; and (c) no seasonal pattern to symptoms.

In the winter session, individuals who met the above criteria for seasonality and high

depression symptom severity were also screened for the presence of a current major depressive episode via a self-reported Screening Questionnaire for Major Depressive Episode, Current (Wesner & Tan, 1999, Appendix 3) that was based on the *DSM-IV TR* (American Psychiatric Association, 2000) diagnostic criteria. Those who scored positive were given a follow-up SCID interview to confirm the diagnosis. As will be seen later, information on the clinical status of the SAD individuals was used to assess whether they differ on the severity of their depression symptoms.

During the summer session, the SAD group endorsed a low depression score (HDRS-29 < 14). Individuals within the Control group were also checked to ensure that they remained nondepressed (HDRS-29 < 14).

Materials

Hamilton Depression Rating Scale With the Addendum Atypical Symptoms (see Appendix 1)

The 29-item Hamilton Depression Rating Scale with the addendum atypical symptoms (HDRS-29) is a measure of depression severity. It is based on the 21-item Hamilton Depression Rating Scale (Hamilton, 1960; 1967) that was deemed to be insufficient for the assessment of SAD (Rosenthal, 1989; Wirz-Justice & Anderson, 1990) because it did not address atypical symptoms. Consequently, an addendum of eight more items to address the atypical symptoms was developed to expand the HDRS-21 to HDRS-29 (Williams et al., 1988). Each item on the HDRS-29 is rated on a 5-point scale that ranges from 0 (not at all) to 4 (marked or severely). An overall score is obtained by summing the ratings across items 1-29. Higher HDRS scores reflect greater severity of depressive symptoms. The HRDS-29 was used for group classification in the present study.

Seasonality Screening Questionnaire (see Appendix 2)

Section A. This section queried about the subject's demographic information (i.e., age, sex, program year, marital status) and substance use pattern (including alcohol, drugs, and medication) that may account for some of the depressive symptoms.

Section B. Items in this section were geared towards the assessment of seasonality. Some items were derived from Rosenthal's (1993) SPAQ while other items were developed specifically to address *DSM-IV TR* seasonal specifier criteria and to obtain more information. Those that were derived from the SPAQ are identified as such below.

Question 1 was derived from the SPAQ to ascertain the seasonal pattern of typical and atypical depressive symptoms. Whereas the SAD group was to endorse symptom exacerbation during winter and fall months and symptom alleviation during spring and summer months, the Control group was to endorse no characteristic seasonal pattern.

Questions 2 and 3 were included to determine whether the seasonal pattern of depression symptoms occurred within the last two years, and whether the number of seasonal episodes outnumbered the nonseasonal episodes within the last six years.

Question 4 was derived from the original Rosenthal's (1993) SPAQ. It assessed the degree of seasonality by summing the degree of change scores over six symptoms to produce an overall Global Seasonality Score (GSS). The degree of change was rated on a 5-point scale where 0 indicated no change and 4 indicated extremely marked change. A GSS of 0 to 7 suggested no seasonality and a score of 12 or more suggested high seasonality.

Question 5 was derived from the SPAQ to assess degree of impairment associated with the seasonal changes. The impairment can be rated from none to disabling. The SAD group would report at least moderate seasonal impairment, whereas the Control group would report no to mild degree of impairment.

Question 6 and 7 were developed by Wesner and Tan (1999) to assess for the presence of seasonal stressors as the *DSM-IV TR* criteria specifies that the seasonal changes can not be accounted for by seasonal stressors.

The SPAQ has been faulted for failing to correlate with prospective measures of mood seasonality (Murray, 2003). Nonetheless, the additional time period of assessment (during summer, Time 2) in which SAD individuals were required to report Control levels of depressive symptomatology confirms that this study's SAD sample evidenced a seasonal pattern of symptoms.

Screening Questionnaire for Major Depressive Episode, Current (see Appendix 3)

This section (Wesner & Tan, 1999) consists of questions designed to screen for the presence of Major Depressive Episode (MDE), Current. Questions were extrapolated from the computerized version of the NIMH Quick Diagnostic Interview Schedule-III R (Robins, Heltzer, Croughan, & Ratcliff, 1981) and cross-checked with the current Structured Clinical Interview for DSM-IV (First, Gibbon, Williams, & Spitzer, 1995). Additional questions were included to assess impairment; the exclusionary criteria of depressive symptoms arising from medical conditions, bereavement, and substance use; previous occurrence of MDE; and whether the participant believed that he/she was experiencing the symptoms of MDE at the time of assessment.

Structured Clinical Interview for DSM-IV Axis I Disorders

The interview version of the SCID (First, Gibbons, Williams, & Spitzer, 1995) was used to confirm the diagnosis of Major Depressive Episode, Current in research participants who scored positive on the above Screening Questionnaire for Major Depressive Episode, Current.

The Cognitive Styles Questionnaire (see Appendix 4)

The Cognitive Styles Questionnaire (Abramson, Metalsky, & Alloy, 1990) is a measure of cognitive vulnerability to depression. It is a revised version of the Attributional Style Questionnaire (ASQ; Seligman, Abramson, Semmel, & von Baeyer, 1979) that has good psychometric properties (Peterson, 1991; Peterson & Seligman, 1984 for a review). Modifications to the ASQ that were incorporated into the CSQ include the addition of extra hypothetical events to make a total of 12 positive and 12 negative achievement and interpersonal events, and the addition of three inferences to each item concerning the consequences, self-worth implications, importance of each hypothetical event.

Both convergent and predictive validity of the CSQ are acceptable (Just & Alloy, 1997). Predictive validity for the CSQ is also discussed in Alloy, Abramson, Murray, Whitehouse, and Hogan (1997). Internal consistency of both the 12 positive and the 12 negative events are acceptable at alphas of .86 and .88, respectively (Just & Alloy, 1997).

For the purpose of the present study, only the 12 negative events and the dimensions of Stability, Globality, and Self-Worth implications are of interest. The Internality scale in the CSQ was not looked at because a close inspection of its items reveals that the scale does not differentiate between internal-behavioural and internal-characterological explanations. The internal-behavioural explanations are those that are ascribed to the self and are behavioural and changeable, whereas the internal-characterological explanations relate to relatively more nonmalleable personal or characterological defects. The Self-worth Implications scale was used instead because its items better reflect the internal-characterological types of explanations.

The Stability dimension was assessed with items (c), Globality dimension with items (d), and Self-Worth Implications dimension with items (f). Each item was scored on a 1-7 rating point scale. The Stability dimension measures the degree to which the respondent attributes the

causes for hypothetical situations to stable causes. The Globality dimension measures the degree to which the respondent attributes the causes for hypothetical situations to global causes. The Self-Worth Implications dimension measures the degree to which the individual attributes the causes for hypothetical situations to characterological (internal and relatively uncontrollable) causes. Scores of each attributional dimension were obtained by summing the ratings of the relevant items across all hypothetical situations. Higher scores on each dimension indicated greater ascription to that particular dimension of explaining an event outcome

The Response Styles Questionnaire (see Appendix 5)

The Response Styles Questionnaire (RSQ) contains 41 items designed to assess dispositional coping styles to depressive episodes (Nolen-Hoeksema, 1990). It is composed of four scales that assess ruminative coping (Ruminative Responses Scale), distractive coping (Distracting Responses Scale), problem-solving coping (Problem Solving Scale), and dangerous activities coping (Dangerous Activities Scale). The RSQ shows acceptable test-retest reliability (Just & Alloy, 1997), and acceptable predictive validity (Butler & Nolen- Hoeksema, 1994; Nolen-Hoeksema & Morrow, 1991; Just & Alloy, 1997; Nolen-Hoeksema, 1990; Nolen-Hoeksema & Morrow, 1991).

The Ruminative Response Scale assesses the tendency to focus on the self, symptoms, and possible causes and consequences of depressive mood. It possesses acceptable internal consistency at .89 (Nolen-Hoeksema & Morrow, 1993). The Distracting Responses Scale includes items designed to assess the tendency to engage in pleasant and benign distractive activities in response to a depressed mood. The Distracting Responses Scale posseses acceptable internal consistency at .80 (Nolen-Hoeksema & Morrow, 1993). The Dangerous Activities Scale assesses the tendency to engage in reckless or dangerous activities in response to the

participant's depressive symptoms. The Problem Solving Scale assesses responses that serve to actively solve some problems that are related to the participant's depressive symptoms. Convergent and predictive validity for these scales have been found to be acceptable (Butler & Nolen-Hoeksema, 1994; Nolen-Hoeksema & Morrow, 1991).

Each item on the RSQ is a statement that encapsulates one of the four coping responses to a depressed mood. Each item contains a response scale ranging from 1 (never) to 4 (always). To score each scale on the RSQ, the ratings on the item that comprise each scale are summed. A higher score on a particular scale indicates a greater tendency to employ that particular coping style in response to a depressed mood.

The Winter Stress Scale (see Appendix 6)

The Winter Stress Scale (WSS; Dew & Tan, 2003) was used in the present study to explore the propositions of the cognitive content specificity hypothesis (Beck, 1983) in SAD. It was developed to investigate the respondent's dread of winter (item 1), stressfulness of atypical symptoms during the winter (item 2), degree of impairment caused by the atypical symptoms experienced during the winter (item 3), rumination strategy used to cope with the winter atypical symptoms (item 4), and psychological stress in the fall/winter (item 5). These items are discussed in greater detail below.

- Item 1 measures the dread of winter (W-Dread) on a scale of 1 (not at all) and 5 (extremely). Higher scores indicate a greater level of dread.
- Item 2 assesses whether the respondent experiences the atypical symptoms during the winter, and if so, the degree of stress (on a rating scale 1 to 5) associated with each symptom (W-Atypical). Higher scores indicate higher stress. Absence of a particular atypical symptom would be indicated by a score of "0".

- Item 3 taps into the degree of impairment caused by the winter atypical symptoms (W-Impair). This construct is measured on a scale of 1 to 5 where higher scores indicate greater impairment.
- Item 4 has six questions that were designed to measure the participant's tendency to employ a rumination coping strategy during fall/winter (W-Ruminate). Each question was rated on a 5-point rating scale. A total score was obtained by summing across all six questions. Higher summed scores reflected greater use of rumination. The conceptual underpinning of these questions was based on Nolen-Hoeksema's (1987) theory that depressed people tended to ruminate on the negative and engage in wishful thinking more than nondepressed individuals.
- Item 5 which is the Winter Perceived Stress Scale (WPSS) is based on the Perceived Stress Scale (PSS, Cohen, Kamarck, & Mermelstein, 1983) The WPSS was designed to measure the extent to which the participant felt life to have been more unpredictable, uncontrollable, and unmanageable in the fall/winter than usual. The questions in Item 5 are almost identical to the PSS with two differences. The PSS used a frequency scale of measurement ("how often") while Item 5 measures the degree of agreement with the statement on a 5-point scale. The time frame assessed by the PSS is within the last month whereas Item 5 compares the fall/winter functioning of the respondent against his/her usual functioning. The PSS has been found to predict psychological outcomes independently of psychopathology (Cohen, 1986; Cohen et al., 1983) and its predictive validity has been supported (Fava et al., 1992; Pbert et al., 1992). Congruent with PSS research (Hewitt et al., 1992; Pbert et al., 1992), the WPSS evidences two orthogonal factors (Dew & Tan, 2003). As in the

PSS, WPSS factor 1 is composed mainly of negative affect items and WSS factor 2 consists mainly of perceived ability to cope with stressors (Dew & Tan, 2003). Regarding interpretation, WPSS Factor 1 refers to negative affective reactions to winter stimuli and WPSS Factor 2 refers to perceived ability to cope with extant stressors (Dew & Tan, 2003). WPSS Factor 1 is composed of eight questions. Seven questions are negatively worded (question a, b, c, h, k, l, and n) and one question that is positively worded (question i). WPSS Factor 2 has six questions that are positively worded (question d, e, f, I, k, and m). Negatively worded questions need to be reverse-scored. Ratings across the fourteen items are summed after the appropriate reverse scoring has been performed. Higher summed scores reflect greater stress in fall/winter.

Sociotropy-Autonomy Scale - Revised (see Appendix 7)

The Sociotropy-Autonomy Scale - Revised (SAS-R; Clark, Steer, Beck, & Ross, 1995) is a self-report measure designed to assess the personality styles of sociotropy and autonomy. The SAS-R contains 59 items of which 30 items represent the sociotropy dimension and 29 represent the autonomy dimension. The items of the sociotropy dimension represent a construct of concern about rejection, isolation, derision, disapproval, attachment/separation, and pleasing others. The range of possible scores on the Sociotropy scale is 116 with higher scores indicating greater degree of sociotropy.

The items of the autonomy dimension reflect a complex of beliefs, attitudes, and goals that motivate an individual to seek out independence and achievement, have concern about the possibility of personal failure, and value the maximization of control over the environment. The autonomy dimension is composed of two subscales: Solitude (13 items) and Independence (17

items). A principle components analysis of the of the SAS-R Solitude and Independence subscales revealed that the subscales explained similar amounts of variance in undergraduate student responses at 7.4% and 6.2%, respectively, and that the correlation between the two subscales was low at .18 (Clark et al., 1995). Each item is rated on a 0-4 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 characteristics.

The SAS-R evidences improved psychometric properties over the original SAS and evidences strong convergent and discriminant validity (Clark et al., 1995). The Sociotropy, Solitude, and Independence scales evidence good internal consistency with Cronbach coefficient alphas of .88, .78, and .74, respectively (Clark et al., 1995).

The Shipley Institute of Living Scale (see Appendix 8)

The Shipley Institute of Living Scale (SILS, Shipley, 1982) was used to estimate participant's verbal IQ in order to statistically control for differences in verbal abilities between groups in case verbal IQ affects performance on the modified Stroop test. The SILS is a 40-item forced-choice test. Participants are presented with 40 target words that are in capital letters. Four words in lower case letters are placed beside each of the 40 target words. The participant is asked to circle one of the lower case words that is most similar in meaning to the target word. The SILS is scored by placing an answer template over the answer sheet and by summing correctly answered questions. A higher score indicates higher verbal ability. The SILS is associated with adequate test-retest reliability (Ruiz & Krauss, 1967; Stone, 1965) and with adequate convergent as it significantly correlates with the Wide Range Vocabulary Test (Martin, Blair, & Vickers, 1979).

Word Rating Scale (see Appendix 9)

The words that were used in the Stroop task were selected to represent three cognitive content categories (depression, SAD-related, and neutral). There were 13 words in each of the cognitive content category. Each of these words was matched on frequency, word length, and the degree to which each word is congruent to the content domain (i.e., depression experience, fall-winter-related, and neutral). Frequency of occurrence in the English language was accounted for through norms provided by Kucera and Francis (1967).

In order to arrive at the final list of 39 words that were used in the Stroop task, a pilot study was conducted. In this pilot study, graduate-level clinical psychology students were asked to rate 259 words in the Word Rating Scale on 9-point Likert scales for their representativeness or relevance of the word to the depression, SAD, or neutral concepts category. These 259 words were selected from a dictionary and thesaurus on the basis of their semantic association to the three concept categories. The ratings for each word were averaged across the pilot subjects. Thirteen words within each category with the highest averaged representativeness ratings and that exceed the averaged score of 6.0 were selected to be presented in the Stroop test.

Apparatus

A computerized version of the modified Stroop colour-naming task was used. The Stroop task was presented on a Toshiba 3000 laptop with a 14.1 inch colour monitor. A one-second presentation of a small white square in the centre of the monitor preceeded each stimuli word in order to draw the participant's attention to the centre of the screen. The word stimuli remained onscreen until the participant responds by pressing the coinciding colour button (i.e., b for blue, g for green, r for red, and y for yellow). The word stimuli onset activated an internal timer that recorded response latency in milliseconds.

Experimental Tasks

Modified Stroop Task

Participants completed the modified Stroop task individually. Participants were seated in front of the computer and were read the instructions on how to complete the modified Stroop task. They were asked to indicate the colour of the words presented on the computer screen as quickly and correctly as possible by pressing buttons that represent coinciding colours. When participants reported that they understood the instructions, they completed two practice rounds to familiarize themselves with the task. Any questions that they had were then answered before the modified Stroop task began.

Stimulus word order presentation was generated randomly and each word appeared once in each of the four different colours (i.e., green, blue, red, and yellow). In total there were 156 trials. Errors were recorded by the computer. The amount of time it took for each participant to make a response (latency response) was recorded by the computer as well.

Recall Task

There was an immediate and a delayed free recall task. The immediate free recall task took place immediately after the modified Stroop task. Participants were asked to write down as many words as they could recall from the word lists they had been exposed to in the modified Stroop task. The delayed free recall task was implemented after an intervening period had passed following the immediate free recall task. During this intervening period, the participants were asked to complete questionnaires that tapped into the psychological factors of interest in the study. Approximately 25 minutes elapsed between immediate and delayed tasks. For each of the immediate and delayed tasks, the number of correctly recalled words for each content domain was computed. Both an immediate and a delayed recall task were employed to determine the extent to which words relevant to particular domains were still retained after an intervening

period with interference tasks.

Procedure

The present study included a recruitment phase, a research session for the winter (Time 1) and a research session for the summer (Time 2). Procedural details are outlined below.

Recruitment Phase

Participants were recruited from Lakehead University's Introductory Psychology classes during the winter time. They were approached during class time and informed of the study. Those who were interested were given a screening research questionnaire that consisted of a cover letter (see Appendix 10), an informed consent form for the recruitment phase (see Appendix 11), the Seasonality Screening Questionnaire, the Hamilton Depression Rating Scale, and the Screening Questionnaire for Major Depressive Episode, Current. A copy of a list of mental health resources for Thunder Bay (see Appendix 12) were also included for those who desired to contact such services. The Recruitment Debriefing Form (see Appendix 13) was also given with an invitation to contact the researcher should they have questions or concerns. Those who met the research criteria during the recruitment phase were invited to the winter research session.

Time 1 Research Session

Winter (Time 1) research sessions were conducted during the months of January through March. Introductory Psychology student participants who came to this session were given a review of the procedure of the study and a Time 1 Consent Form (see Appendix 14) to complete. Those classified as SAD based on their high HDRS-29 score ($\geq$ 22), GSS score ($\geq$ 12) and scored positive on the Screening Questionnaire for Major Depressive Episode, Current were given a SCID interview to determine whether or not they met the criteria for major depression.

No diagnosis was communicated to the participants. Both the SAD and the Control participants were then administered the modified Stroop task (see below) on an individual basis. This was immediately followed by the first recall task (see Appendix 15). Participants were then given the following measures to complete: the Cognitive Styles Questionnaire, the Response Styles Questionnaire, the Winter Stress Scale, the Sociotropy-Autonomy Scale – Revised, and the Shipley's Institute of Living Scale. Following completion of the measures, participants then completed a second recall task (see Appendix 16). After completion of the second recall task, they were given the Time 1 Debriefing Form (see Appendix 17). Introductory Psychology student participants were offered 1 bonus point towards their course marks or entry into three $100 random prize draws, depending on their preference. They were thanked for their involvement in the project and reminded that they would be contacted again for their Time 2 research sessions in the summer. Participants in the winter (Time 1) research session had the opportunity to ask questions at the end of the session. They had their names entered into the three random draws worth $100 each.

Previous experience (e.g., Dew & Tan, 2003) has shown that most if not all of the clinically depressed individuals are aware of their depression. All participants were provided with a resource sheet (Appendix 12) that contained mental health counseling services in the university and the community. Although the supervisor of the present study who is a clinical psychologist was available to provide immediate support to any participant who might require it, no participant availed themselves to that option.

Time 2 Research Session

Both the SAD and the Control group were contacted during the late spring/summer (from April to July) to undergo the Time 2 research session. Any persons who refused to return for the

study were thanked for their interest and previous participation in the study.

At the beginning of the summer research session, the nature and procedure of the study was revisited with all participants. They then completed the Time 2 Research Consent Form (see Appendix 18). To ensure that all participants were not depressed, they were administered the Hamilton Depression Rating Scale to confirm that they achieved a score of less than 14. Participants completed the modified Stroop task followed by the first recall task. They then completed the Cognitive Styles Questionnaire, the Response Styles Questionnaire, the Winter Stress Scale, and the Sociotropy-Autonomy Scale Revised. Finally, they completed the second recall task. Towards the end of the session, they were given the Time 2 Debriefing Form (see Appendix 19) and were given the opportunity to ask questions. They were thanked for their participation in the study, and invited to contact the researcher should they have further questions or any concerns. All participants received $10 each for their part in Time 2 research session.

Results

Overview of Research Design

The present study consisted of two groups (SAD, Control) who were tested during the winter (Time 1) and the summer (Time 2). Hence, the research design was a mixed Group (between-subject) by Time (within-subject). Dependent variables were:

(a) explanatory style (Stability, Globality, and Self-Worth Implications that measures internal-characterological style)

(b) coping styles in response to depressive mood (Rumination, Distraction, Problem-Solving, and Dangerous Activities)

(c) personality styles (Sociotropy, Solitude and Independence)

(d) self-reported reactions to winter stimuli: Dread of Winter (Winter Dread), Stress Associated with Seasonal Atypical Symptoms (W-Atypical), Impairment Associated with Seasonal Atypical Symptoms (W-Impair), Rumination in Response to Winter Stimuli, (W-Ruminate) and the Winter Perceived Stress Scale consisting of two factors, Affective Reaction to Winter Stimuli (WPSS Factor 1) and Perceived Ability to Cope With Winter Stimuli (WPSS Factor 2)

(e) response latency to SAD, Depressed, and Neutral words presented during the modified Stroop Task and

(f) immediate recall of SAD, Depressed, and Neutral words presented during the modified Stroop Task and

(g) delayed recall of SAD, Depressed, and Neutral words presented during the modified Stroop Task.

Sample Characteristics

The sample consisted of 20 SAD (6 males, 14 females) and 20 Control (7 males, 13 females). An ANOVA showed no significant age difference, F (1, 38) = .02, *ns,* between SAD (age range 18 – 31 years, M = 20.65, SD = 3.41) and Control (age range 18 – 28 years, M = 20.80, SD = 3.04).

Group differences in depression severity as determined with the Hamilton Depression Rating Scale Total scores (HDRS-T) was examined. A Group x Time ANOVA on the HDRS-T revealed a significant main effect for Time, F (1, 38) = 133.33, $p < .001$ that was qualified by a significant Group x Time interaction, F (1, 38) = 116.64, $p < .001$. Simple effects analysis revealed that the SAD group scored significantly higher on the HDRS-T during both winter, F (1, 38) = 149.62, $p < .001$ and summer, F (1, 38) = 9.24, $p < .01$. The results from the winter

session were not unexpected given that the group classification criteria required SAD (M = 47.25, SD = 14.59) to score higher than the Control (M = 6.25, SD = 3.46) at that time. However, during the summer when the HDRS-T scores for SAD (M = 8.35, SD = 3.36) fell to within the nondepressed range, the SAD group still scored higher than the Control group (M = 4.95, SD = 3.71). Given that the summer HDRS-T might act as a confound in subsequent analyses that involved dependent variables with which it has a significant correlation, its effects were controlled for through its use as a covariate.

Group differences on the typical symptoms of the HDRS (HDRS-Typical) were investigated. A Group x Time ANOVA on HDRS-Typical revealed significant main effect for Time, F (1, 38) = 59.37, $p < .001$, and for Group F (1, 38) = 64.81, $p < .001$. However, these main effects were qualified by a significant Group x Time interaction, F (1, 38) = 55.68, $p < .001$. Simple effects analyses revealed that the SAD group reported significantly higher HDRS-Typical scores during the winter F (1, 38) = 65.92, $p < .001$ (SAD M = 14.25, SD = 6.65, Control M = 1.70, SD = 1.90), but not during the summer, F (1, 38) = .38, *ns* (SAD M = 1.80, SD = 1.67, Control M = 1.50, SD = 1.36).

Similar analyses were conducted on the atypical symptoms of the HDRS (HDRS-Atypical). A Group x Time ANOVA revealed significant main effects for Time, F (1, 38) = 96.37, $p < .001$, and for Group, F (1, 38) = 115.71, $p < .001$. Both were qualified by a significant Group x Time interaction, F (1, 38) = 81.60, $p < .001$. Simple effects analyses revealed that the SAD group reported significantly higher HDRS-Atypical scores both during the winter, F (1, 38) = 110.68, $p < .001$ (SAD M = 33.00, SD = 11.81, Control M = 4.55, SD = 2.59) and the summer, F (1, 38) = 10.38, $p < .01$ (SAD M = 6.55, SD = 3.19, Control M = 3.45, SD = 2.89).

An ANOVA as a function of Group was performed on the Global Seasonality Score (GSS). The SAD group (M = 16.40, SD = 2.82) was found to be significantly more seasonal than the Control group (M = 3.80, SD = 2.65), F (1, 38) = 212.43, $p < .001$. Time was not included as an independent variable in the analysis because GSS was measured only during the winter time when the participants were being classified into Groups.

Of the 20 SAD individuals, a structured clinical interview during the winter established that 5 of them met the *DSM-IV TR* criteria for Major Depressive Episode whereas the remaining 15 did not. An ANOVA on winter HDRS-T scores with *DSM-IV TR* status as the independent variable revealed no significant difference, F (1, 18) = 1.46, *ns*, indicating that the winter HDRS-T scores of those who met the clinical criteria for depression (M = 54.00, SD = 12.31) was not significantly different from that of those who did not meet the *DSM-IV TR* criteria (M = 45.06, SD = 14.21).

The characteristics of the sample are detailed in Table 2. As can be seen, most of the participants in both groups were in their first year of undergraduate studies, single, white, did not use alcohol or illicit drugs regularly. Finally, there were no group differences on Shipley Institute of Living Scale score.

Pre-analysis Issues

Prior to statistical analysis, all dependent variables were examined for accuracy of data entry, missing values, and fit between their distributions and the assumptions of multivariate and univariate analysis.

Missing data. The data was examined for missing values. All participants, for the most part, had a complete set of responses. In the infrequent case of a missing value on any questionnaire item, the group mean for that item was substituted for that missing value. The

mean substitution strategy serves to preserve the participant in the data without changing the mean of that distribution for that variable of that particular group (Tabachnick & Fidell, 2001, p. 62).

Univariate outliers. Within-group univariate outliers, defined as cases with standardized scores greater than $z = 3.29$ (Tabachnick & Fidell, 2001, p. 67) were identified and their raw scores were recoded to one unit higher than the most extreme score in their distribution (Tabachnick & Fidell, 2001, p. 71). This strategy serves to reduce the influence of these cases while still preserving their deviancy with respect to the other cases within the group (Tabachnick & Fidell, 2001, p.71).

Multivariate outliers. Within-group outliers were looked for using two criteria: the Mahalanobis Distance and Cook's D. A multivariate outlier, as assessed by the Mahalanobis distance strategy is a case whose distance from the centroid of all remaining cases within a group is greater than a critical value defined by a χ^2 critical value (Tabachnick & Fidell, 2001, p. 68). This critical value is dependent upon the group size, number of dependent variables involved, and the alpha level and can be looked up in a table provided by Stevens (1986, p. 93). Cook's D strategy identifies multivariate outliers that are influential (Stevens, 1986, p. 126). Influential data points are those that result in a change in regression coefficients when deleted from the database, and are defined as a case that have a Cook's D greater than 1.00. These cases are considered outliers by virtue of their influence and deviancy when compared against the other cases within the group (Tabachnik & Fidell, 2001, p. 69). For the purpose of the present study, a multivariate outlier was considered to be any case that exceeded either the critical value for the Mahalanobis distance or Cook's D, and would be deleted if found. However, no multivariate outliers were found, and hence, no cases were deleted.

Normality, linearity, and homeoscedasticity. Detrended normality plots for separate dependent variables were examined for normality. The plots revealed modest violations in some cases (e.g., Problem-Solving, Winter Perceived Stress Scale Factor 2), this was not of a major concern because the univariate *F* is robust to such violations in instances such as this where the problem is not due to outliers (Tabachnick & Fidell, 2001, p. 329). Furthermore, statistical tests would be robust to modest violations of normality when the sample sizes are equal and when the sample size is big enough to produce 20 *df* for error (Tabachnick & Fidell, 2001, p. 329). Such is the case in this study.

Within-group bivariate scatterplots of dependent variables that were looked at together as a set in multivariate analyses were assessed for linearity and homoscedasticity (Tabachnick & Fidell, 2001, pp. 72-80). Generally, assumptions of linearity and homoscedasticity were met with some mild to modest violations. This would reduce the power of the analysis to some degree but given that the violations were not serious, it was not deemed necessary to transform the variables (Tabachnick & Fidell, 2001, pp. 330-331). The assumption of homoscedasticity was also examined using the Box's *M* test. Nonsignificance of the test indicates that the assumption was met. In situations where the assumption was violated (e.g., Coping Style), Type I error would be inflated but only to a small degree. Stevens (2002) noted that the "actual α was within .02 of the level of significance for levels of .05 and .10" (p. 262).

Multicollinearity and singularity. Multicollinearity and singularity in simultaneously analyzed dependent variables were examined through pooled correlation matrices of related subscales within each measure (see Table 3). Multicollinearity and singularity are indicated in simultaneously analyzed variables correlate in excess of .90 (Tabachnik & Fidell, 2001, pp. 82-83). Results revealed no cases of multicollinearity or singularity.

Homogeneity of regression. The assumption of homogeneity of regression is relevant to analysis involving covariates. It states that the regression between the covariate and the dependent variables is the same across all groups being examined in the analysis (Tabachnick & Fidell, 2001, p. 331). This assumption would be met in covariate analyses if no significant interaction between the covariate and the independent variables were found. However, the assumption of homogeneity of regression was not violated in the analyses.

Overview of the Analyses

Relationships Between Summer HDRS-T and Dependent Variables

Given that the previous analyses showed that SAD and Control groups were significantly different on the summer HDRS-T, correlations between the summer HDRS-T and the dependent variables were examined to see where the former might be a confound in analyses. As can be seen from Table 4, summer HDRS-T scores were significantly correlated with the following dependent variables measured during the summer: two RSQ subscales (Rumination and Problem-Solving), five Winter Stress Scale items (W-Dread, W-Atypical, W-Impair, W-Ruminate, and WSS Factor 1), and Stroop response latency to the depression word list. In analyses involving these dependent variables, summer HDRS-T was employed as a covariate.

Statistical Analytic Strategies

Multivariate analytic strategies. Full-factorial Group (between-subject) x Time (within-subject) multivariate analysis of variance (MANOVA) was performed on these sets of dependent variables:

1. Explanatory Style (Stability, Globality, Self-Worth Implications)
2. SAS Subscales (Sociotropy, Solitude, Independence)

Group (between-subject) x Time (within-subject) multivariate analysis of covariance (MANCOVA) with summer HDRS-T as a covariate were performed on these sets of dependent variables:

1. Coping Styles in Response to Depressive Mood (Rumination, Distraction, Problem-Solving, Dangerous Activities)
2. Winter Perceived Stress Scale Factors 1 (Negative Affect) and Factor 2 (Perceived Ability to Cope with Winter Stimuli)

For both MANOVAs and MANCOVAs, Pillai's Trace *F* was adopted to assess for significant omnibus multivariate effects because it is the most robust criterion (Tabachnik & Fidell, p. 248). Significant multivariate effects were followed up with an investigation to determine which dependent variables contributed to the significant omnibus effect. This involved the use of a full-factorial Group by Time Analysis of Variance (ANOVA) or Analysis of Covariance (ANCOVA) on each dependent variable. A Bonferroni split was employed to protect the overall alpha against Type I error (Tabachnik & Fidell, p. 349).

After determining which dependent variable contributed to the group discrimination, the next step was to find out how the cells involved in the significant omnibus effect differed from each other. For significant main effects involving Group or Time both of which involved only two cells, this was established by comparing the means of the two cells involved. For significant Group x Time interaction effects that would involve four cells, four follow-up tests were conducted specifically to address the hypotheses in the study. The first two tests determined whether there were group differences during the winter and during the summer, respectively. This was done through the use of independent-sample *t*-tests. The last two tests ascertained how

each of the two groups changed from winter to summer. This was done by using paired-samples *t*-tests. To maintain Type I error at the .05 level, each of the four tests was assessed at .0125.

Univariate analytic strategies. Separate full-factorial Group by Time ANOVA was conducted on:

(a) WSS Item 3 (W-Impair)

(b) Immediate Recall of SAD words presented during the modified Stroop test

(c) Immediate recall of Depression words

(d) Immediate recall of Neutral Words

(e) Delayed Recall of SAD words presented during the modified Stroop test

(f) Delayed recall of Depression words

(g) Delayed recall of Neutral Words

(h) Response Latency to SAD words presented during the modified Stroop test,

(i) Response latency to Neutral words.

Separate full-factorial Group by Time ANCOVA with Time 2 HDRS-T as a covariate were conducted on:

(a) WSS Item 1 (W-Dread)

(b) WSS Item 2 (W-Atypical)

(c) WSS Item 4 (W-Ruminate)

(d) Response Latency to Depression Words Presented During the modified Stroop Task

For significant main effects in both ANOVA and ANCOVA, cell means were examined to determined how the two groups or two seasons differed from each other. For any significant interaction effects observed, independent-sample *t*-tests were used to find out how the two

groups differed from each other during the winter and again during the summer. Paired-samples *t*-tests were used to find out how each group changed across the season.

Main Analysis

Cognitive Styles Questionnaire

A MANOVA with Group (SAD, Control) as the between-subject factor, and Time (Winter, Summer) as the within-subject factor was performed on three Cognitive Styles Questionnaire (CSQ) subscales (Stability, Globality, and Self-Worth Implications). Table 5 summarizes the omnibus findings from the MANOVA and Table 6 shows the descriptive statistics associated with the three CSQ subscales.

Results revealed a significant main effect for Time, F (1, 38) = 9.09, $p < .01$, and a significant main effect for Group, F (1, 38) = 39.161, $p < .001$. Both main effects were qualified by a significant Group x Time interaction, F (1, 38) = 10.027, $p < .01$. To establish which of the CSQ subscales were responsible for the interaction effect, individual ANOVAs with Group (between-subject factor) and Time (within-subject factor) were performed on each of the three CSQ subscales. Type I error was protected at the overall α rate of 0.05 by using a Bonferroni-split approach where each of the three ANOVA was assessed at $\alpha = 0.0167$.

The ANOVA on Stability revealed a significant main effect for Group, F (1, 38) = 7.86, p = .008 which was qualified by a significant Group x Time interaction effect, F (1, 38) = 9.16, p = .004. The independent-samples *t*-tests that were performed showed that winter Stability was higher for the SAD group (M = 47.15) than for the Control group (M = 34.35), $t(38) = 4.02$, $p <$ .001, but that there was no significant difference in summer Stability between the SAD (M = 41.25) and the Control (M = 37.65) group. Paired-samples *t*-tests revealed no significant difference for the SAD group in Stability across the seasons (winter M = 47.15, summer M =

41.25). Similarly, the Control group did not change across the seasons (winter $M = 34.35$, summer $M = 37.65$).

The ANOVA on Globality revealed significant main effects for Time, $F(1, 38) = 14.68$, $p = .002$, and Group, $F(1, 38) = 44.291$, $p < .001$, which were qualified by a significant interaction effect, Group x Time interaction effect, $F(1, 38) = 10.88$, $p = .002$. Independent-samples *t*-tests revealed that winter Globality was higher for the SAD group ($M = 54.95$) than for the Control group ($M = 29.65$), $t(38) = -8.41$, $p < .001$. Likewise, summer Globality was higher for the SAD group ($M = 44.25$) than for the Control group ($M = 28.85$), $t(38) = -4.09$, $p < .001$. Findings from paired-samples *t*-tests showed that the SAD group decreased in their Globality from winter ($M = 54.95$) to summer ($M = 44.25$), $t(19) = 4.16$, $p < .001$, whereas the Control group remained stable across seasons (winter $M = 29.65$, summer $M = 28.85$).

The ANOVA on Self-Worth Implications Style revealed significant main effects for Time, $F(1, 38) = 9.89$, $p < .01$, and Group, $F(1, 38) = 39.19$, $p < .001$. Results showed that the SAD group ($M = 41.63$) was higher than the Control group ($M = 24.58$) in reported use of Self-Worth Implications explanatory style regardless of the season. Reported use of the Self-Worth Implications explanatory style was higher in the winter ($M = 36.3$) than in the summer ($M = 29.90$) regardless of group membership. It is noteworthy that there was no significant Group x Time effect suggesting that the Self-Worth Implications Explanatory Style did not contribute to the significant interaction effect observed in the omnibus MANOVA.

Response Styles Questionnaire

A MANCOVA with Group (SAD, Control) as the between-subject factor, Time (Winter, Summer) as the within-subject factor, and summer HDRS-T as a covariate was performed on four Response Styles Questionnaire (RSQ) subscales of Rumination, Distraction, Problem-

Solving, and Dangerous Activities. Table 7 summarizes the omnibus findings from the MANCOVA and Table 8 shows the descriptive statistics associated with the four RSQ subscales.

Results revealed a significant main effect for Time, F (1, 37) = 32.50, $p < .001$, and a significant main effect for Group, F (1, 37) = 68.43, $p < .001$. However, both main effects were qualified by a significant Group x Time interaction, F (1, 37) = 48.54, $p < .001$. To establish which of the RSQ subscales contributed to the significant Group x Time interaction effect, individual ANCOVAs with Group (between-subject factor), Time (within-subject factor), and summer HDRS-T (covariate) was performed on each of the four RSQ subscales. Type I error was protected at the overall α rate of 0.05 by using a Bonferroni-split approach where each of the four ANCOVA was assessed at $\alpha = 0.0125$. The assumption of Homogeneity of Regression was not violated in any of the analyses.

The ANCOVA on Rumination revealed a significant Group x Time effect, F (1, 37) = 99.60, $p < .001$. The independent-samples t-tests showed that winter Rumination was higher for the SAD group (M = 52.70) than for the Control group (M = 37.25), t (38) = -5.81, $p < .001$. The reverse pattern was shown for summer Rumination with the SAD group ruminating less (M = 10.60) than the Control group (M = 27.70), t(38) = 12.81, $p < .001$. Paired-samples t-tests revealed that the SAD group decreased from winter (M = 52.70) to summer (M = 10.60) in rumination, t(19) = 19.31, $p < .001$. The Control group also decreased from winter (M = 37.25) to summer (M = 27.70), t(19) = 5.33, $p < .001$, although the change was less dramatic than that observed for SAD as can be seen from the cell means.

The ANCOVA on Distraction revealed a significant Group x Time effect, F (1, 37) = 129.17 $p < .001$. Independent-samples t-tests showed no significant difference in winter Distraction between the SAD (M = 28.05) and the Control (M = 29.40) group. However in the

summer, the SAD group ($M = 41.85$) engaged in Distraction to a greater extent than the Control group ($M = 9.40$), $t(38) = -13.24$, $p < .001$. Paired-samples t-tests showed that the SAD group increased in Distraction from winter ($M = 28.05$) to summer ($M = 41.85$), $t(19) = -5.52$, $p < .001$, whereas the Control group decreased from winter ($M = 29.40$) to summer ($M = 9.40$), $t(19) = 18.89$, $p < .001$.

The ANCOVA on Problem-Solving revealed a significant Group x Time effect, $F(1, 37) = 404.16$, $p < .001$. Independent-samples t-tests yielded no significant difference in winter Problem-Solving between the SAD ($M = 10.10$) and Control ($M = 10.30$) groups. However in the summer, the SAD group ($M = 29.15$) engaged in Problem-Solving activities to a greater extent than the Control group ($M = 5.55$), $t(38) = -24.13$, $p < .001$. Paired-samples t-tests showed that the SAD group increased its Problem-Solving from winter ($M = 10.10$) to summer ($M = 29.15$), $t(19) = -22.40$, $p < .001$, while the opposite pattern was evident for the Control group (winter $M = 10.30$, summer $M = 5.55$), $t(19) = 7.95$, $p < .001$.

The ANCOVA on Dangerous Activities revealed no significant findings.

Sociotropy Autonomy Scale

A repeated measures MANOVA with Group (SAD, Control) as the between-subject variable, and Time (Winter, Summer) as the within-subject variable was performed on the three Sociotropy Autonomy Scale (SAS) subscales (Sociotropy, Solitude, Independence). Table 9 summarizes the omnibus findings from the MANOVA and Table 10 shows the descriptive statistics associated with the three SAS subscales.

Results revealed a significant main effect for Time, $F(1, 38) = 6.30$, $p < .05$, and a significant main effect for Group, $F(1, 38) = 27.68$, $p < .001$. Both main effects were qualified by a significant Group x Time interaction effect, $F(1, 38) = 5.26$, $p < .05$. To establish which of

the SAS subscales were responsible for the interaction effect, individual ANOVAs with Group (between-subject variable) and Time (within-subject variable) were performed on each of the three SAS subscales. Type I error was protected at the overall α rate of .05 by using a Bonferroni-split approach where each of the three ANOVA was assessed at $\alpha = .0167$.

The ANOVA on Sociotropy revealed a significant main effect for Time, $F(1, 38) = 12.40$, $p = .001$, and Group, $F(1, 38) = 21.07$, $p < .001$. Results revealed that reported Sociotropy levels were higher in the SAD group ($M = 96.25$) than in the Control group ($M = 74.65$), whereas reported Sociotropy was higher in winter ($M = 89.10$) than in summer ($M = 81.80$). The interaction effect was not significant, suggested that Sociotropy did not contribute to the significant interaction effect observed in the omnibus MANOVA.

The ANOVA on Solitude revealed a significant main effect for Group, $F(1, 38) = 11.08$, $p = .002$. The SAD group ($M = 34.25$) reported higher Solitude than the Control group ($M = 28.48$) across seasons. Due to the absence of a significant Group x Time effect, Solitude was not deemed to be a factor responsible for the significant interaction effect observed in the omnibus MANOVA. The ANOVA on Independence revealed no significant effects and therefore further analyses were not conducted.

Winter Perceived Stress Scale

A MANCOVA with Group (SAD, Control) as the between-subject variable, Time (Winter, Summer) as the within-subject variable, and summer HDRS-T as covariate was performed on the two WPSS Factor 1 (Factor 1: Negative Affect) and Factor 2 (Perceived Ability to Cope With Winter Stimuli). Table 11 summarizes the omnibus findings from the MANCOVA and Table 12 shows the descriptive statistics associated with the two factors.

Results revealed a significant multivariate main effect for Time, F (1, 37) = 5.58, $p < .05$, and a significant multivariate main effect for Group, F (1, 37) = 41.11, $p < .001$. To establish which of the WPSS factors were responsible for the main effects, individual ANCOVAs with Group (between-subject factor), Time (within-subject factor), and summer HDRS-T (covariate) were performed on each of the two WPSS factors. Type I error was protected at the overall α rate of 0.05 by using a Bonferroni-split approach where each of the four ANCOVA was assessed at $\alpha = 0.025$.

The ANCOVA on Factor 1 revealed a significant main for Group, F (1, 37) = 63.43, $p <$ .001. The SAD group (M = 29.05) reported higher perceived negative affect in comparison to the Control group (M = 14.65) across seasons. It is noteworthy that no significant effect was found for Group x Time, indicating that Factor 1 did not contribute to the significant interaction effect found in the omnibus MANCOVA. The ANCOVA on WPSS Factor 2 revealed no significant effects. Further analyses were therefore not conducted.

WSS Items 1 Through 4

Table 13 shows the descriptive statistics associated with the four WSS items.

Winter Dread. An ANCOVA with Group (between subject variable) and Time (within subject variable) as independent variables and summer HDRS-T as a covariate was performed on WSS 1. Results revealed a significant main effect for Group, F (1, 37) = 21.73, $p<.001$. The SAD group (M = 3.05) was higher than the Control group (M = 1.63) regardless of the seasons.

W-Atypical. An ANCOVA with Group (between subject variable) and Time (within subject factor) as the independent variables and summer HDRS-T as a covariate was performed on WSS 2. There was a significant main effect for Group, F (1, 37) = 34.53, $p <$ .001. The SAD group (M = 10.25) was higher than the Control group (M = 2.66) across the seasons.

W-Impair. An ANOVA with Group (between subject variable) and Time (within subject variable) was performed on WSS 3. The ANOVA revealed a significant main effect for Time, F (1, 38) = 4.98, p , <.05, and for-Group, F (1, 38) = 70.06, $p <$ .001. The SAD group (M = 3.23) was higher than the Control group (M = 1.33) across the seasons. Impairment was higher in winter (M = 2.44) than in summer (M = 2.13) regardless of group membership.

W-Ruminate. An ANCOVA with Group (between subject variable) and Time as independent variables and summer HDRS-T as a covariate was performed on WSS. There was a significant main effect for Group, F (1, 37) = 106.44, $p <$ .001. The SAD group (M = 20.7) was higher than the Control group (M = 9.68).

Response Latency to Words Presented During the Modified Stroop Task

Table 14 shows the descriptive statistics associated with response latency to words presented during the modified Stroop task

Response Latency to SAD Words Presented During the Modified Stroop Task. An ANOVA with Group (between subject) and Time (within subject) was performed on response latency to SAD words presented during the modified Stroop task. The analysis revealed a significant main effect for Time, F (1, 38) = 15.79, $p <$ .001. Response latency for SAD words presented during the modified Stroop task increased from winter (M = 714.19 milliseconds) to summer (M = 802.38 milliseconds).

Response Latency to Depression Words Presented During the Modified Stroop Task. An ANCOVA with Group (between subject) and Time (within subject) as the independent variables and summer HDRS-T as the covariate was performed on response latency to Depression words presented during the Modified Stroop task. The ANCOVA revealed no significant effects.

Response Latency to Neutral Words Presented During the Modified Stroop Task. An ANOVA with Group (between subject) and Time (within subject) as the independent variables was performed on response latency to Neutral words presented during the modified Stroop task. The ANOVA revealed a significant main effect for Time, F (1, 38) = 9.37, $p < .01$. Response latency to SAD words presented during the modified Stroop task increased from winter (M = 716.38 milliseconds) to summer (M = 794.47 milliseconds).

Immediate Recall of Words Presented During the Modified Stroop Task

Table 15 shows the descriptive statistics associated with immediate recall of words presented during the modified Stroop task.

Immediate Recall of SAD Words. An ANOVA with Group (between subject) and Time (within subject) was performed on Immediate Recall of SAD Words. The ANOVA revealed a significant main effect for Time, F (1, 38) = 10.33, $p < .01$. Immediate recall of SAD words presented during the modified Stroop task increased from winter (M = 3.33) to summer (M = 4.45) across groups.

Immediate Recall of Depression Words. An ANOVA with Group (between subject) and Time (within subject) was performed on Immediate Recall of Depression Words. The results revealed a significant main effect for Time, F (1, 38) = 8.12, $p < .01$. Immediate recall of Depression words presented during the modified Stroop task increased from winter (M = 1.45) to summer (M = 2.08) across groups.

Immediate Recall of Neutral Words. An ANOVA with Group (between subject) and Time (within subject) was performed on Immediate Recall of Neutral Words. The ANOVA revealed a significant main effect for Time, F (1, 38) = 57.99, $p < .001$. Immediate recall of

Neutral words presented during the modified Stroop task increased from winter (M = .48) to summer (M = 1.78) across groups.

Delayed Recall of Words Presented During the Modified Stroop Task

Table 15 shows the descriptive statistics associated with delayed recall of words presented during the modified Stroop task

Delayed Recall of SAD Words Presented During the Modified Stroop task. An ANOVA with Group as the between subject variable, and Time as the within subject variable was performed on Delayed Recall of SAD Words. The ANOVA revealed a significant main effect for Time, F (1, 38) = 8.94, p< .01.Results showed that Delayed Recall of SAD words presented during the modified Stroop task increased from winter (M = 2.98) to summer (M = 4.05) across groups.

Delayed Recall of Depression Words Presented During the Modified Stroop task. An ANOVA with Group as the between-subject factor, and Time as the within subject variable was performed on Delayed Recall of Depression Words. No significant effects were found.

Delayed Recall of Neutral Words Presented During the Modified Stroop Task. An ANOVA with Group as the between subject variable, and Time as the within subject variable was performed on Delayed Recall of Neutral Words. The ANOVA revealed a significant main effect for Season, F (1, 38) = 30.89, p < .001. Delayed recall of Neutral words presented during the modified Stroop task increased from winter (M = .48) to summer (M = 1.20).

Discussion

The objective of the present study was to compare psychological characteristics between individuals with subclinical seasonal affective disorder (SAD) and individuals who were neither seasonal nor depressed (Control). The study was further designed to assess the temporal stability

of these psychological characteristics across the winter and summer seasons. The psychological characteristics that were assessed include explanatory style, coping styles in response to depressed mood, personality styles, stress appraisal to winter stimuli, as well as response latency to and recall of word stimuli in a modified Stroop task. These characteristics were measured in the same individuals in winter and again in the summer. The findings from the study are discussed below in relation to the hypotheses and the objectives of the study.

Explanatory Style

The first set of hypotheses stated that SAD would be associated with a more stable, global, and characterological (i.e., higher self-implication explanatory style score on the Cognitive Styles Questionnaire) in comparison to Control both during the winter and summer. It was further hypothesized that SAD would endorse a significantly less negative explanatory style during the summer than during the winter. The hypotheses were largely confirmed. SAD did show a more stable, global, and characterological (self-implicational explanatory style) than Control during the winter, which echoes previous findings (Levitan, Rector, & Bagby, 1997). The findings further partially confirmed study hypotheses in that the SAD group remained higher than Control on the globality and characterological dimensions during the summer. However, it was indistinguishable from Control on stability. In partially confirming the hypotheses, SAD decreased in global and characterological explanatory styles from winter to summer. Taken together, it can be concluded that although the global and characterological explanatory styles are affected to some degree by mood or season, they nonetheless remain in a more maladaptive direction in SAD relative to Control, as predicted by the Dual-Vulnerability Hypothesis. It would appear that SAD individuals attribute negative events to a wide variety of causes, a significant number of which are seen as caused by themselves and are seen as uncontrollable (i.e.,

characterological). Results also showed that the Control group's explanatory style on the stability and globality dimensions remained stable across the seasons, yet decreased on the characterological dimension from winter to summer.

The stability dimension is notable because it is the only explanatory style out of the three in which SAD did not show an elevation during the summer when compared to the Control group. SAD reported higher stability than Control during the winter, but no significant group difference was found during the summer testing. It is important to note that a salient characteristic in SAD is that the seasonal symptoms that characterize the SAD depressive episodes are closely associated with predictable, time-limited factors (i.e., the changing of the seasons). Such a strong association may lead the SAD individual to explain their depressive moods as being primarily caused by an unstable factor.

The observation that SAD retained its more negative explanatory style (with the exception of the stability dimension) compared to Control might be viewed as a reflection of the timing of the summer assessment, rather than a real difference. More specifically, it could be argued that had the assessment taken place later in the summer when SAD was well into remission, no group differences might have been found. This is unlikely for two reasons. First, SAD depression symptom severity had decreased to a level during the summer testing sufficient to fit the study's inclusion criteria indicative of normality (i.e., Control group inclusion criteria). Second, analyses showed that summer explanatory style bore no significant relationship to the summer Hamilton Depression Rating Scale scores. The findings confirm the Dual-Vulnerability Hypothesis that psychological factors associated with depression remain at a significantly heightened level outside the SAD depressive episode.

Coping Styles

The second set of hypotheses pertained to rumination coping style which involves the use of cognitions and behaviors that focus one's attention on possible causes and consequences of one's depression and on one's depressive symptomatology (Nolen-Hoeksema, 1987; 1991; Nolen-Hoeksema et al., 1993). It was predicted that SAD would endorse higher rumination during both the winter and the summer in comparison to Control. It was further predicted that SAD would decrease in rumination from winter (during the depressive episode) to summer (during remission). The hypotheses were partially confirmed - the SAD group exhibited greater rumination than the Control group during the winter, and the SAD group decreased its rumination from winter to summer. However, the Control group also similarly decreased in rumination from winter to summer.

Contrary to the hypotheses however, SAD rumination during the summer was *lower* than Control rumination during the summer. This is surprising in light of the Dual-Vulnerability Hypothesis (DVH). The DVH posits a high depression loading for SAD that would lead one to assume rumination, which bears a strong relationship to depression (see review by Thomsen, 2006), to be present to a greater degree in SAD than in Control participants, regardless of the season. Furthermore, the finding also contradicts previous research that shows significantly higher rumination in SAD than in Control during the summer (Rohan, Simon, & Dorhofer, 2003).

It is tempting to interpret the temporal instability of rumination to mean that it might not be a cognitive vulnerability which is supposed to be more permanent in nature. Rather it might reflect a response to depressed mood as per the original formulation by Nolen-Hoeksema (1991). This could explain why in the absence of depressed mood such as during the summer time, the rumination decreased for SAD individuals. The noteworthy point here is that the decrease

observed was drastic to the degree that SAD individuals were unexpectedly lower in rumination than the Control group during the summer. Perhaps the rumination in the summer in SAD individuals was offset by their use of more adaptive coping styles as reflected in the increased use of distraction and problem-solving by SAD individuals during the summer than winter.

It would be premature to discount rumination as a cognitive vulnerability factor, despite the findings obtained in the present study. Rumination has been found to exacerbate negative thinking in depression (Lavender & Watkins, 2004) as well as to predict both depressive disorder relapse and new onsets of depressive disorder (Nolen-Hoeksema, 2000), thereby reinforcing its role as a vulnerability factor in depression. Consistent with the cognitive-content specificity hypothesis, it is possible that rumination acts as a cognitive vulnerability factor in SAD that requires the advent of winter (a schema-congruent stressor for SAD which heralds the impending onset of a depressive episode) to activate the depression. The activation of cognitive vulnerability factors by stressors that induces depression has been reported in studies on remitted depression (Ingram, Miranda, & Segal, 1998; Just, Abramson, & Alloy, 2001).

Methodological factors might also account for the unexpected finding that SAD rumination is lower than Control rumination in the summer, which is incongruent with the findings by Rohan et al. (2003). Rohan's study employed a clinical sample whereas the present study looked at a primarily subclinical sample that evidenced high depressive symptom severity, yet did not necessarily meet clinical criteria for depression. However, statistical analyses in the present study showed that the subclinically depressed participants and the clinically depressed participants did not differ in their depressive symptom severity. It is therefore not clear whether the clinical status (or lack of) might account for the divergence in findings between Rohan's and the present study.

The discrepant results also may be attributable to the timing of the assessment of the SAD group in the summer time when the depression was in remission. Rohan et al. (2003) assessed SAD individuals during June and July; in the present study, the SAD group was tested between late April and July. Although the SAD individuals in both studies were determined to be nondepressed during their summer testing time, Rohan's participants might have been further along in their remission period. It would be beneficial to replicate the current study and compare the findings obtained during the early versus later part of the remission period. This would help to test the reliability of the present findings and to determine whether the timing of the testing affects the results.

An interesting observation is that although no group differences were observed during the winter for distraction and problem-solving response styles, the SAD group increased its distraction and problem-solving strategies from winter to summer to the extent that it exceeded the level of the Control group during the summer. It is possible that as the depression alleviates and the SAD individuals become less impaired, they have more energy, concentration, and motivation to engage in more adaptive forms of coping. Additionally, they might have learned to associate the signs of spring/summer, such as the increase in ambient temperature and a lengthening in the photoperiod, with an imminent ebb of their depression which increases their hope of better mental health and promotes their motivation to engage in more adaptive coping patterns.

Another interesting and unexpected finding relates to the functioning of the Control group. Its engagement in distraction and problem-solving during the summer was significantly lower than during the winter. There are two possible reasons for this finding. First, it is possible that the results reflect the student sample's handling of school stress. This is unlikely however,

because 70% of the Control sample was assessed while school was still in session during both the winter and summer testing periods. As such, one would expect that if school was the primary factor affecting coping styles, then coping styles would have remained largely stable.

Another possible explanation might be that winter, and its accompanying seasonal changes, are a challenge to everyone regardless of their depression history. Research shows that 92% of the general population experiences at least some degree of seasonality (Kasper, Wehr et al., 1989). It is therefore possible that Control individuals were using more distraction and problem-solving to cope with minor difficulties associated with winter. As a result, distraction and problem-solving may have decreased as the winter abated.

Findings from coping styles form an interesting gestalt. In particular, SAD showed greater adaptive coping styles from winter to summer in the form of decreased rumination and increased use of distraction and problem-solving strategies. This contrasts with the opposite pattern exhibited by the Control group who remained stable in rumination and decreased use of problem-solving and distraction. There are two possibilities that may account for this general shift in SAD coping styles across the seasons.

First, a controversial feature of SAD, referred to as polarity, may account for the general shift towards healthy coping in SAD during the summer. Polarity can be defined as an increase in mood and energy during the summer that SAD individuals experience outside of their depressive episode (Blehar & Rosenthal, 1989). It is possible that the shift of coping styles to a more pleasure- and goal-oriented type of coping (i.e., less rumination, more distraction, and more problem-solving) reflect a switch in polarity from depressive to a "hyperthymic" mood (Blehar & Rosenthal, 1989).

A second explanation is that the shift towards more adaptive coping by SAD may reflect remission from the SAD depressive episode. More specifically, it is possible that the shift towards a state of adaptive coping engages a short-term process of mood repair (Dalgleish & Spinks, 2001). Rumination is hypothesized to play a role in the increased activation of depressive schemas through "Spreading Activation" (Segal, Williams, Teasdale, & Gemar, 1996). During the spring, SAD participants endorsed significantly less rumination in comparison to Control. It is interesting to speculate that the pleasure associated with increased distraction coping style and the mastery associated with increased problem-solving, in the context of muted rumination, may serve to progressively activate adaptive schemas or conversely, allow the depressive schema to become more dormant. The question as to whether the coping styles revealed in the present study are relatively short-term and reflect only an early state of remission or whether they are a relatively enduring state that remains stable throughout the SAD remission stage remains unaddressed. To better assess this question the present study should be replicated with time since depressive mood offset used as an independent variable (e.g., 2 weeks vs. 2 months since depressive mood offset).

Personality Style

The third set of hypotheses involved Sociotropy which refers to a stable complex of beliefs, attitudes, and goals that motivate individuals to seek out positive relations with others (Bagby et al., 2001; Beck et al., 1983; Dozois & Backs-Dermott, 2000). Sociotropic individuals believe that the attainment of interpersonal conditions such as social acceptance and approval are necessary for self-worth. (Bagby et al., 2001; Beck et al., 1983; Dozois & Backs-Dermott, 2000). Sociotropic individuals are adversely affected by negative social conditions such as rejection, isolation, and derision.

It was predicted that during both seasons, sociotropy would be higher in the SAD than in the Control group. Results confirmed the hypotheses and validated the construct of sociotropy as being a relatively "stable" complex of beliefs, attitudes, and goals, and that it is not a response predicted by depressive mood levels. Hence sociotropy acts as a vulnerability to the SAD depressive episode. This is congruent with the predictions of the DVH that predicts high depression loading for SAD.

A puzzle emerges from the findings related to sociotropy. Research has clearly delineated how social rejection can precipitate depression in individuals who are high in sociotropy or social dependency (e.g., Francis-Reniere, Alloy, & Abramson, 2006; Sato & McCann, 1997). The stressor (social rejection) matched the schema in the social dependent individuals. In the case of SAD, the stressor is winter that has nothing to do with social rejection, and therefore logically should not be associated with sociotropy. The answer could lie in the decreased opportunities to socialize during the winter. The sociotropic person hence becomes socially isolated and as a result, might find the winter time depressing.

The two remaining SAS subscales, Independence and Solitude, were also measured in the present study. There were no differences between SAD and Control on Independence during the winter or during the summer. As well, no seasonal trend was reported for either group. However on the Solitude subscale, SAD scored higher than Control during both seasons. This might appear to suggest that SAD individuals had a higher preference for social aloneness across seasons and that this variable might represent a vulnerability to the SAD depressive episode. The higher Solitude score for SAD across the seasons might seem counter-intuitive in the light of the higher Sociotropy scores for SAD across the seasons as well. After all, an individual cannot desire social approval from others and at the same time, not care much for what others think.

When the mean scores for Solitude (M = 34.25) and Sociotropy (M = 96.25) for the SAD group are compared against the highest possible score that could be obtained for the Solitude (highest = 52) and Sociotropy (highest = 116) subscales, it is clear that SAD individuals were markedly high on the Sociotropy continuum of scores but only a little above average on the Solitude continuum. Within that context, it would be safe to conclude that SAD individuals are primarily sociotropic in their personality style.

Cognitive Schematic Content

The final three sets of hypotheses have implications for the investigation of the cognitive schematic content in SAD. It is postulated that cognitive schematic content varies across certain psychiatric disorders and so psychiatric disorders can be differentiated on the basis of their unique cognitive schematic content (Beck & Perkins, 2001). The present study used one self-report measure (the Winter Stress Scale) and two objective measures (the modified Stroop task and the explicit recall task) to assess the cognitive schematic content.

In the modified Stroop test, participants were shown three word lists (depression, SAD, and neutral) that were presented in colour, and were required to name the colour of the word while ignoring its semantic content. Their delayed response latency represented by the amount of time it took for them to respond was measured. There were two components in the explicit recall task. Participants were asked to recall as many words as they could remember from the word list they had just seen (immediate recall) and then again after some time had intervened during which they engaged in other tasks related to the study (delayed recall). The number of words they could recall accurately from each word list was noted in both the immediate and delayed recall task.

Winter Stress Scale. The Winter Stress Scale assessed a variety of participant reactions to winter stimuli. The fourth set of hypothesis in the study was fully supported. The SAD group reported higher dread of winter, more stress and impairment from atypical symptoms associated with the SAD depressive episode, more rumination about winter stimuli, as well as more negative affect associated with winter stimuli than Control both during the winter and the summer. The group differences remained stable across the seasons despite results showing SAD individuals as endorsing lower depression severity, more adaptive coping patterns and a more specific explanatory style during the summer.

This finding extends previous research (Dew & Tan, 2003) that showed that the self reported level of negative appraisal of winter stimuli is both uniquely high in SAD during the winter and distinguishes SAD from the S-SAD, nonseasonal depression and Control groups. The present study extends these findings by showing that the uniquely high level of self-reported level of negative appraisal of winter stimuli remains at a stable level during the remission period in the summer.

The present findings support the existence of a particular schema in SAD that is characterized by a dread of winter that persists into the summer. However, the presence of the schema during the winter does not precipitate a depressive episode, possibly because of the absence of the relevant stressor, such as the impending environmental signs of winter that include reduced ambient temperature and obvious shortening of daylight hours. As seen in the previous results section on coping style, a reduction in rumination accompanied by an increase in problem-solving and distraction strategies might also help to alleviate any depressed mood.

Modified Stroop Task. It was predicted within the fifth set of hypothesis that during the winter, the SAD group would evidence longer response latency than the Control group to SAD

and Depression words, but that during the summer, the longer response latency would be evident only for the SAD word list. The hypotheses were not supported. Results revealed that the groups did not differ in their response latency to any of the three word lists during the winter or during the summer. Furthermore, both groups increased their response latency to SAD and Neutral word lists during the summer. This is discrepant from the findings reported by Dalgleish and Spinks (2001) who observed that their SAD participants were slower in their response to SAD and Depression word lists than to neutral word list during both summer and winter.

Two salient possibilities may account for the discrepancy. First, the two studies differed in the manner in which the modified Stroop task was conducted. In the current study, the task was computerized. In the Dalgleish and Spinks (2001) study, the task was conducted manually. Research suggests that the computerized and noncomputerized formats of the modified Stroop task may tap into different factors, and hence, may account for the discrepant results (Kindt, Bierman, & Brosschot, 1996). A second explanation may be the increasing trend in the literature that points to inadequate psychometric properties associated with the modified Stroop task (Vasey, Dalgleish, & Silverman, 2003). As such, more research on the psychometric properties of the modified Stroop task would be beneficial.

Free Recall Task. The final and sixth set of hypotheses stated that when compared to the Control group, the SAD group would recall more SAD content words on both the immediate and delayed recall during the summer and the winter. These hypotheses were not supported. SAD and Control did not differ in their immediate recall of the SAD, Depression, or Neutral words either during the winter or the summer. However, both groups showed better immediate recall of the three word lists during the summer. When it came to the delayed recall task, no group differences were found on any of the word lists either during the winter or the summer.

However, both groups performed better on the SAD and Neutral word list during the summer than during the winter. The higher recall for words during the summer might reflect a practice effect as the same words were used at both times of assessment. However, this is doubtful given the long duration of time between the two testing periods. An alternative explanation could be then both SAD and Control groups experienced some stress during the winter time that slowed down their cognitive processing speed. There is evidence after all to show that even the non-SAD people do experience some seasonal changes (Kasper, Wehr, et al., 1989).

The absence of group differences on the free recall tasks may be due to the "depth of processing" effect (Craik & Tulving, 1975). It is a fairly well-established finding that depressed individuals exhibit higher recall for words related to the depression experience (Mathews & MacLeod, 1987), yet SAD individuals (who also experience depression) exhibited no higher recall ability for depression words compared to Control during the depressive episode. Such a finding suggests that the recall effect may have been inhibited. The modified Stroop task oriented participant processing to the structural features of word stimuli (i.e., processing the colour that the words were presented in). This constraint may have inhibited the recall effect. Research shows that little advantage for explicit recall is conferred for word stimuli that are processed in terms of their structure (e.g., whether they are presented in lower case or upper case or whether they rhyme with another word, Craik & Tulving, 1975). Rather, research shows that explicit recall is enhanced for word stimuli that are processed in terms of their meaning (e.g., generating a word that meaningfully fits the context of a presented sentence, Craik & Tulving, 1975). Orienting the processing of SAD individuals to the structural features of word stimuli may have inhibited any extra meaning that SAD individuals may have attached to SAD and

Depressed words. Future SAD research would therefore benefit from assessing the explicit recall task in which meaningful processing of word stimuli is not constrained.

Another explanation for the lack of significant findings may be that there is no cognitive schematic material relevant to SAD which would be posited by traditional SAD etiological theorists (e.g., Levitan et al., 1997). However, this position does not explain the consistent significant group differences in the Winter Stress Scale. It is important to note that the majority of findings that support the cognitive content specificity hypothesis originate from self-report form-based studies (Beck & Perkins, 2001). Perhaps the nature of the assessment (self-reports vs. task-oriented) might have an influence in how the results turn out.

Strengths and Limitations

The findings from the present study need to be viewed with some caution given several of its shortcomings. The most salient criticism of the present study is that because the SAD group did not meet the criteria for *DSM-IV TR* Major Depressive Episode, they are not representative of a clinical population. Statistical analyses were therefore performed to explore whether those individuals who fulfilled diagnostic criteria for *DSM-IV TR* Major Depressive Episode were different in the severity of their depression symptoms from those who did not fulfill the diagnostic criteria. Results showed that there was no significant difference in depression severity between the two subgroups. As such, it can be concluded that individuals who were classified as SAD were of similar depression severity as individuals who suffered from clinical depression in the current study. Regardless, this study should be replicated with a clinical SAD sample to examine if clinical status makes a difference in the findings.

Another drawback to the study is its two-week time frame as adopted in the Hamilton Depression Rating Scale for assessing low depression severity. In the *DSM-IV TR* (American

Psychiatric Association, 2000), the time frame for remission from depression is implied to be a minimum of two months: "During the past 2 months, no significant signs or symptoms of the disturbance (depressive episode) were present" (p. 413). Given the considerably shorter time period for assessing low depression severity in the present study, it could be argued that some of the participants might have some residual depression left that confounded the findings. However, this is quite unlikely given that residual depressive symptoms would have been detected with the use of the Hamilton leading to elevated scores. Furthermore, the Hamilton scores of the SAD participants during the summer were low and equivalent to that achieved by the nondepressed Controls during that season. Finally, any confounding influences attributed to the Hamilton scores during the summer were partialled out statistically during the data analyses. As such, it is unlikely that residual depression confounded results to a significant degree.

The sampling and distribution of the participants across the groups need to be considered. All the participants were derived from an undergraduate student population. It can be argued that reliance on an undergraduate student population limits the generalizability of the findings of the study. As well, given that the academic year begins in the fall and continues through the winter, it is possible that school is a stressor that brings about the depressive episodes in the SAD group. This issue was kept in mind when assessing participants for seasonality. It was confirmed with the participants that school was not a stressor for them and their responses were cross-checked with their pattern of symptoms over the 12 months of the SPAQ. Specifically, the participants in the SAD group reported exam times during April and December to be stressful for them. However, the onset of their symptoms was before December and the remission in April and May. As well, despite reporting that December was stressful for them, several of the participants indicated an improvement of their symptoms in that month. When asked, they responded that

December meant Christmas, family times, and party fun. In short December represented heightened social engagement with others that they seem to value. Hence, there was no correspondence between their stated stressful months and the onset and remission of their typical and atypical symptoms, suggesting that school may not be a seasonal stressor for these people. As well, several of the participants reported summer, rather than fall and winter to be a stressful time for them because they worried about summer employment and their financial situation. Given that there was no temporal covariation between the occurrence of the depressive symptoms and situational stresses, it is determined that the winter depression was not linked to the presence of seasonal stressors.

It is wondered whether the use of a largely undergraduate sample limits the generalizability of findings to the seasonal and nonseasonal population as a whole. It could be argued that if the cause of SAD is light-related, then light deprivation should affect everyone in a similar fashion, regardless of whether they are students or otherwise. However, research suggests that the prevalence of SAD drops between the ages of 40 and 50 (Kasper, Wehr et al., 1989). Therefore, it is possible that those who have greater experience of coping with their problems, such as older adults, may cope with their problems in a more adaptive manner during the winter. Developmental changes associated with aging might also account for the reduced prevalence rate of SAD among the more mature population; however this is a mere speculation given that no research to date has looked at the lifespan issues relating to SAD. Regardless, the homogeneity in the composition of the mostly Caucasian subclinical student sample in the present study could reduce the generalizability of the findings to the community and clinical sample. The present study needs to be replicated with other demographic groups to ensure the stability of the results.

Another notable limitation of this study regards the groups of study. In particular, this study compared a SAD group with a nonseasonal nondepressed group. It included no nonseasonal depression group. As such, the degree to which it can be concluded that the findings of this study are unique to SAD is limited. This is particularly so regarding the finding that SAD endorsed a high degree of winter stress (via the Winter Stress Scale) which is posited to represent winter-related cognitive schematic content unique to SAD. It is noteworthy however, that previous research has demonstrated that SAD is associated with higher winter stress (winter-related cognitive schematic content) than nonseasonal depression during both of their respective depressive episodes (Dew & Tan, 2003). Nonetheless, it would strengthen the conclusiveness of the position that winter stress represents cognitive schematic content that is unique to SAD if future research includes a nonseasonal depression group for direct comparison to a SAD group.

A final limitation of the present study is that it did not exclude individuals who were using antidepressant medication from the SAD group. Whether the use of antidepressants presents a confound in the findings is unclear. Future research needs to examine whether the use of antidepressants serve to modify cognitive, behavioural, and affective reactions in seasonal and nonseasonal individuals.

A strength of the present study lies its seasonality criteria that are more stringent than those typically used in previous works. Other studies typically rely on the use of the Global Seasonality Score to identify seasonality in SAD individuals (e.g., Bartko & Kasper, 1990; Mersch et al. 1999a). However, this may not be sufficient as it has to be established that the onset and remission of symptoms follow a seasonal pattern, that the pattern has to be evident at least within the last two years, that the seasonal pattern has to be impairing to the individual, and that there were no seasonal stressors that could account for the annual onset of depression. These

criteria were adopted in the present study. Hence, individuals who reported a high seasonality score but showed no seasonal pattern to their symptoms, did not have a seasonal pattern at least within the last two years, and who did not experience impairment were excluded.

Another strength of the present study is its longitudinal nature where data was collected during the depressive episodes and during the remission period. The majority of studies that assessed psychological variables that are associated with the SAD depressive episode were cross-sectional and were conducted solely during the SAD depressive episode. The present study therefore has the important advantage of being designed to more clearly assess the temporal stability of the observations obtained during the depressive episodes and offer a more complete picture of the psychological functioning of individuals with SAD.

Finally, the present study controlled for the confounding effects of the summer depression severity on the results through covariate analysis where appropriate. As such, it can be concluded that significant differences between groups likely were not a result of depression severity between groups.

Summary

Findings from the present study indicate that SAD individuals in some respects had more adaptive psychological functioning during the summer than the winter time. For example, although SAD individuals ruminated more than their Control counterparts during the depressive episode, they ended up ruminating less and used more distraction and problem-solving than the Control group during the summer when the depressive episode had abated. SAD individuals also ruminated less and increased their use of distraction and problem-solving during the summer.

Nonetheless, a number of psychological variables remained at a more depressive level in SAD during the summer when compared to the Control group. For example, results revealed that

although SAD is associated with a more stable, global, and characterological explanatory style in comparison to Control during the depressive episode, SAD remained associated with a more global and characterological explanatory style compared to Control during the summer. Finally, sociotropy and solitude levels in the SAD group were higher than in the Control group during the depressive episode and during the remission. Finally, SAD individuals reported more dread of winter and experiencing more severe atypical symptoms during the winter, found the atypical symptoms to be more impairing, ruminated more about winter, and reported more negative affect about winter stimuli relative to Control both during winter and the summer. Such negative reactions towards winter remained high across the seasons.

Conclusion

Conclusions are twofold. First, results showing that explanatory style and sociotropy remains in a significantly different depressive direction in SAD compared to Control outside of the SAD depressive episode confirms the Dual Vulnerability Hypothesis in that SAD individuals continue to possess psychological vulnerabilities even into their remission period. Second, the finding that SAD individuals report a significantly more negative affective reaction to winter stimuli than Control both during the winter and summer time suggest the existence of a cognitive schema that is unique to SAD. This view is bolstered when one considers that winter dread distinguishes SAD individuals from those with S-SAD, nonseasonal depression, and no depression (Dew & Tan, 2003). It appears that a persistent dread of winter forms the unique cognitive schematic content in SAD. If such is the case, it would have implications for the treatment of SAD with cognitive therapy.

Directions for Future Research

Findings from the present study raised several questions. The generalizability and reliability of the current findings needs to be assessed in non-student samples and could be extended to reflect a lifespan perspective (childhood through to mature years) as well given that the prevalence of SAD drops after the age of 40 to 50 (Kasper, Wehr et al., 1989). The stability of the present findings in the SAD group need to investigated and confirmed in future studies. It would be advisable to ensure that the SAD individuals are well into their remission period (at least two months depression-free) before they are assessed. The directionality of effect between psychological variables and symptomalogy should be assessed though prospective or longitudinal study. The cognitive content specificity hypothesis that postulates that unique cognitive schematic contents are associated with different psychiatric disorders remains to be validated in SAD through the use of valid measures of cognitive schematic content that is not affected by memory or response bias.

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Table 1

Classification criteria for SAD and Control Groups

Criteria	SAD	Control
Seasonality[a]		
Seasonal pattern[b]	Yes	No
Seasonal pattern last 2 years	Yes	No
GSS[c]	>11	< 8
Impairment[d]	At least moderate	No or mild
Seasonal stressor	No	Irrelevant
Depression		
HRDS-28 score	>21	<14

[a]Seasonality criteria was 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 interpretation guideline for the GSS score for SAD is from Rosenthal and colleagues (1987). For Depressed and Control, GSS will not matter, as there is no seasonal pattern or seasonal impairment to their symptoms

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

Table 2

Sample Description and Cell Sizes

Characteristics		Group	
		SAD (n=20)	Control (n=20)
Sex of Participants			
	Male	6	7
	Female	14	13
Academic Program Year			
	Year One	16	12
	Year Two	2	6
	Year Three	2	2
Marriage Status			
	Single	17	18
	Common-Law	3	2
Ethnicity			
	White, Non-Hispanic	20	19
	Asian, Pacific Islander	0	1
Alcohol			
	Regular Use	7	7
	No Regular Use	13	13
Prescribed Medication			
	Regular Use	8	4
	No Regular Use	12	16
Illicit Drugs			
	Regular Use	1	1
	No Regular Use	19	19
Mean Age		20.65	20.80
(standard deviation)		(3.41)	(3.04)
Mean Winter HRDS Total Score		47.25	6.25
(standard deviation)		(14.59)	(3.46)
Mean Summer HRDS Total Score		8.35	4.95
(standard deviation)		(3.36)	(3.71)
Mean Global Seasonality Score		16.40	3.80
(standard deviation)		(2.82)	(2.65)
Shipley Institute of Living Score		28.35	28.75
		(3.27)	(4.35)

Table 3

Correlations of Subscales Within Each Measure Pooled Across Group and Time

Subscales	Correlation
Response Styles Questionnaire	
Rumination / Distraction	-.25
Rumination / Problem-Solving	-.01
Rumination / Dangerous Activities	.60***
Distraction / Problem-Solving	.68***
Distraction / Dangerous Activities	-.24
Problem-Solving / Dangerous Activities	.02
Cognitive Styles Questionnaire	
Stability / Globality	.67***
Stability / Self-Worth Implications	.50**
Globality / Self-Worth Implications	.89***
Sociotropy – Autonomy Questionnaire	
Sociotropy / Solitude	.41**
Sociotropy / Independence	-.16
Solitude / Independence	.34*
Winter Stress Scale	
WPSS 1 / WPSS 2	-.11

Note. WPSS 1 = Negative Affect. WPSS 2 = Perceived Ability to Cope.

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

Table 4

Summer Dependent Variable Correlations With Summer Hamilton Depression Rating Scale Scores

Coping Styles (RSQ Subscales):	
Rumination	-.408**
Distraction	.304
Problem-Solving	.471**
Dangerous Activities	.275
Explanatory Styles (CSQ Subscales)	
Stability	.118
Globality	.253
Self-Worth Implications	.266
Sociotropy Autonomy Scale Subscales	
Sociotropy	.294
Solitude	.108
Independence	-.067
Winter Stress Scale	
Item 1: W-Dread	.493***
Item 2: W-Atypical	.533***
Item 3: W-Impair	.244
Item 4: W-Ruminate	.426**
WSS Item 5	
Factor 1	.442**
Factor 2	-.002
Immediate Recall	
SAD	-.145
Depression	-.212
Neutral	-.09
Delayed Recall	
SAD	-.234
Depression	-.207
Neutral	.159
Stroop Response Latencies	
SAD	.223
Depression	.319*
Neutral	.196

Note. Factor 1 and Factor 2, respectively, are the Negative Affect and Perceived Ability to Cope factors that underlie Item 5 of the Winter Stress Scale (i.e Winter Perceived Stress Scale).

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

Table 5

Summary Repeated Measures MANOVA Table on the Cognitive Styles Questionnaire Subscales as a Function of Group and Time

Source	*F*	*p*	power
Between-subjects			
Group	39.16**	<.001	>.99
Within-subject			
Time	9.09*	.005	.84
Group x Time	10.03*	.003	.87

Note. The $df = 1$ and the $df_e = 38$ for all effects.

*$p < .05$. **$p < .001$.

Table 6

Means and Standard Deviations for Cognitive Styles Questionnaire(CSQ) Subscales Stability, Globality, and Self-Worth Implications

CSQ Subscale	SAD		Control	
	Winter	Summer	Winter	Summer
Stability	47.15 (10.90)	41.25 (10.90)	34.35 (9.18)	37.65 (10.62)
Globality	54.95 (10.35)	44.25 (12.97)	29.65 (8.60)	28.85 (10.71)
Self-Worth Implications	48.50 (9.90)	38.65 (13.29)	25.90 (10.35)	24.05 (10.48)

Table 7

Summary Repeated Measures MANCOVA Table on Response Styles Questionnaire Subscales as a Function of Group and Time

Source	*F*	*p*	power
Between-subjects			
Group	68.43**	<.001	>.99
Covariate	.171	.681	.07
Within-subject			
Time	32.50**	<.001	>.99
Group x Time	48.54**	<.001	>.99
Time x Covariate	.48	.49	.11

Note. Covariate = summer HDRS-T.

Note. The df_{source} = 1 and the df_{error} = 37 for all effects.

*$p < .05$. **$p < .001$.

Table 8

Means and Standard Deviations for Response Styles Questionnaire(RSQ) Subscales Rumination, Distraction, Problem-Solving, and Dangerous Activities

RSQ Subscale	SAD		Control	
	Winter	Summer	Winter	Summer
Rumination	52.70 (9.82)	10.60 (1.76)	37.25 (6.70)	27.70 (5.70)
Distraction	28.05 (5.11)	41.85 (10.70)	29.4 (5.50)	9.4 (2.37)
Problem-solving	10.10 (2.40)	29.15 (4.26)	10.30 (2.32)	5.55 (1.00)
Dangerous Activities	6.85 (1.73)	5.90 (1.33)	5.45 (1.05)	5.55 (1.00)

Table 9

Summary Repeated Measures MANOVA Table on the Sociotropy – Autonomy Subscales as a Function of Group and Time

Source	*F*	*p*	power
Between-subjects			
Group	27.68**	<.001	>.99
Within-subject			
Time	6.30*	.02	.69
Group x Time	5.26*	.03	.61

Note. The df_{source} = 1 and the df_{error} = 38 for all effects.

*$p < .05$. **$p < .001$.

Table 10

Means and Standard Deviations for Sociotropy-Autonomy Scale (SAS) Subscales Sociotropy, Solitude, and Independence.

RSQ Subscale	SAD		Control	
	Winter	Summer	Winter	Summer
Sociotropy	102.30 (15.87)	90.20 (18.75)	75.90 (16.61)	73.40 (13.36)
Solitude	35.95 (6.28)	32.55 (7.63)	28.05 (5.03)	28.90 (6.17)
Independence	60.50 (7.63)	60.45 (7.15)	58.85 (6.05)	59.80 (7.51)

Table 11

Summary Repeated Measures MANCOVA Table on WPSS Factors as a Function of Group and Time with Summer HDRS-T as a Covariate

Source	*F*	*p*	power
Between-subjects			
Group	41.11***	>.001	>.99
Covariate (Summer HDRS-T)	.28	.60	.08
Within-subject			
Time	5.58*	.02	.63
Group x Time	.26	.61	.08
Time x covariate	.81	.37	.14

Note. The $df = 1$ and the $df_e = 37$ for all effects.

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

Table 12

Means and Standard Deviations for the Winter Perceived Stress Scale (WPSS) Factors 1 and 2.

WPSS Factor	SAD		Control	
	Winter	Summer	Winter	Summer
Factor 1	30.45 (5.28)	27.65 (6.48)	15.55 (5.64)	13.75 (4.67)
Factor 2	14.05 (4.33)	13.30 (2.99)	14.90 (4.14)	13.40 (4.91)

Table 13

Means and Standard Deviations for Winter Stress Scale (WSS) Items W-Dread, W-Atypical, W-Impair, and W-Ruminate.

WSS Item	SAD		Control	
	Winter	Summer	Winter	Summer
W-Dread	3.05 (1.19)	3.05 (1.28)	1.70 (.73)	1.50 (.61)
W-Atypical	10.55 (4.30)	9.95 (4.11)	3.10 (2.65)	2.25 (2.97)
W-Impair	3.40 (.88)	2.95 (1.10)	1.45 (.61)	1.30 (.47)
W-Ruminate	21.45 (3.47)	19.95 (3.85)	10.00 (3.33)	9.35 (2.85)

Table 14

Means and Standard Deviations for Response Latency to Word Stimuli (SAD, Depression, and Neutral) Presented During the Modified Stroop Task.

Stroop Word Type	SAD		Control	
	Winter	Summer	Winter	Summer
SAD Words	698.12 (84.21)	760.24 (144.53)	730.22 (183.50)	840.55 (160.10)
Depression Words	690.74 (92.09)	755.26 (151.65)	740.70 (171.00)	815.04 (177.80)
Neutral Words	701.49 (97.47)	753.06 (149.78)	731.27 (164.21)	835.87 (196.70)

Table 15

Means and Standard Deviations for Intermediate and Delayed Recall of Words (SAD, Depression, and Neutral) Presented During the Modified Stroop Task.

Word Recall	SAD		Control	
	Winter	Summer	Winter	Summer
Immediate SAD Word Recall	3.70 (1.60)	4.50 (1.98)	2.95 (1.43)	4.40 (1.85)
Immediate Depression Word Recall	1.70 (.98)	2.40 (1.39)	1.20 (.89)	1.75 (1.29)
Immediate Neutral Word Recall	.35 (.49)	1.70 (1.17)	.60 (.82)	1.85 (1.23)
Delayed SAD Word Recall	3.20 (1.77)	4.20 (2.17)	.15 (.37)	.15 (.37)
Delayed Depression Word Recall	1.40 (.82)	1.75 (1.16)	.20 (.52)	.25 .55)
Delayed Neutral Word Recall	.40 (.50)	1.15 (.86)	.20 (.41)	.20 (.41)

Appendix 1: Hamilton Depression Rating Scale

With Addendum Items for Atypical Symptoms

Compared to how you feel when you are in an even or normal mood state, how would you rate 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 or 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 2: Seasonality Screening Questionnaire

Seasonality Screening Questionnaire

Name of project: Attitudes and Behaviours Across Seasons
Researcher: Rob Dew (sadstudy1@hotmail.com), 343-8976
Project Supervisor: Dr. Josephine Tan (346-7751)

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 _____

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 had in the last 8 weeks:

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 all the relevant circles. Note: We are interested in <u>your</u> experience, <u>not others</u> you may have observed.*

1. In the following questions, fill in circles for all applicable months. This may be a single month 0, a cluster of months, e.g., 0 0 0, or 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. 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 <u>had the same pattern</u> as above:

_ Sept.97/Aug.98 _ Sept.98/Aug.99 _ Sept.99/Aug.00
_ Sept.00/Aug.01 _ Sept.01/Aug.02 _ Sept.02/Aug.03

3. (a) Please check the year(s) in the past 6 years which <u>DID NOT have the same pattern</u> as above:

_ Sept.97/Aug.98 _ Sept.98/Aug.99 _ Sept.99/Aug.00
_ Sept.00/Aug.01 _ Sept.01/Aug.02 _ Sept.02/Aug.03

(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 <u>problem</u> 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): _____

Appendix 3:

Screening Questionnaire for Major Depressive Episode, Current

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

In the last 2 weeks nearly every day, I have felt sad, blue, or depressed	YES	NO
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	NO
In the last 2 weeks, I have experienced loss of appetite	YES	NO
In the last 2 weeks, I have lost weight without trying to – as much as 2 pounds a week or as much as 10 pounds altogether	YES	NO
In the last 2 weeks, I have experienced an increase in appetite	YES	NO
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	NO
In the last 2 weeks nearly every night, I have been having trouble falling asleep, staying asleep, or waking up too early	YES	NO
In the last 2 weeks nearly every day, I have been sleeping too much	YES	NO
In the last 2 weeks nearly every day, I have been talking or moving more slowly than is normal for me	YES	NO
In the last 2 weeks, I have to moving all the time -- that is, I couldn't sit still and paced up and down	YES	NO
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	NO
In the 2 weeks nearly every day, I have been feeling worthless, sinful, or guilty	YES	NO
In the last 2 weeks nearly every day, I have been having a lot more trouble concentrating than is normal for me	YES	NO
In the last 2 weeks nearly every day, my thoughts have come much slower than usual or seemed mixed up	YES	NO
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	NO
In the past 2 weeks, I have thought a lot about death – my own, someone else's, or death in general	YES	NO
In the past 2 weeks, I have felt like I wanted to die	YES	NO
In the past 2 weeks, I have felt so low I thought about committing suicide	YES	NO
I have attempted suicide in the past	YES	NO

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 Cognitive Styles Questionnaire

Please try to vividly imagine yourself in each of the situations or sequences of events that follow. Picture each situation as clearly as you can and as if the events were happening to you right now. Place yourself in each situation and decide what you feel would have caused it if it actually happened to you. Although events may have many causes, we want you to choose only one—the major cause if the event actually happened to you. For each situation, you will write down this cause in the blank provided. Then we will ask you some questions about the cause. After you have answered the questions about the cause of the event, think about how you'd react if the situation actually occurred in your life and what the occurrence of the situation would mean to you. Then we will ask you some questions about your views of and reactions to the situation.

*****It is important to remember that there are no right or wrong answers to the questions. The important thing is to answer the questions in a way that corresponds to what you would think and feel if the situations actually were occurring in your life.***

****

1. Imagine that the following sequence of events actually happens to you:

You take an exam and receive a low grade on it.

Questions 1 a-d ask about the cause of your low grade on the exam.

a. Write down the one major cause of your low grade on the exam.

_____

b. Is it something about you or something about other people or circumstances that caused your low grade on the exam: [Circle one number.]

Totally caused by other people or circumstances	1	2	3	4	5	6	7	Totally caused by me

c. In the future when taking exams, will the cause of the low grade on this exam also cause other exam grades of yours to be low? [Circle one number.]

Will never again cause my exam grades to be low	1	2	3	4	5	6	7	Will always cause my exam grades to be low

d. Is the cause of your low grade on the exam something that just causes problems in your exam grades, or does it also cause problems in other areas of your life? [Circle one number.]

Causes problems just in my exam grades	1	2	3	4	5	6	7	Causes problems in all areas of my life

Questions 1e-g ask for your views of and reactions to your low grade on the exam and not about the cause of your low grade on the exam.

e. How likely is it that your receiving a low grade on the exam will lead to other negative things happening to you? [Circle one number.]

Not at all likely to lead to other negative things happening to me	1	2	3	4	5	6	7	Extremely likely to lead to other negative things happening to me.

f. To what degree does your low grade on the exam mean to you that you are flawed in some way? [Circle one number.]

Definitely does not mean I am flawed in some some way	1	2	3	4	5	6	7	Definitely does mean I am flawed in some way

g. How important is it to you that your grade on the exam is low? [Circle one number].

Not at all important	1	2	3	4	5	6	7	Extremely important

****

2. Imagine that the following sequence of events actually happens to you:

You don't have a boy/girlfriend (or spouse) although you want one.

Questions 2a-d ask about the cause of your not having a boy/girlfriend (or spouse) although you want one.

a. Write down the one major cause of your not having a boy/girlfriend (or spouse) although you want one.

_____

b. *Is it something about you or something about other people or circumstances that caused your not having a boy/girlfriend (or spouse) although you wanted one? [Circle one number.]*

Totally caused by other people or circumstances	1	2	3	4	5	6	7	Totally caused by me

c. *In the future when you want a boy/girlfriend (or spouse), will the cause of your not having a boy/girlfriend (or spouse) now also cause you to not have a boy/girlfriend (or spouse) then? [Circle one number.]*

Will never again cause me to not have a boy/girl-friend (or spouse)	1	2	3	4	5	6	7	Will always cause me to not have a boy/girl-friend (or spouse)

d. *Is the cause of your not having a boy/girlfriend (or spouse) something that just causes problems in whether or not you have a boy/girlfriend (or spouse), or does it also cause problems in other areas of your life? [Circle one number.]*

Causes problems just in whether or not I have a boy/girlfriend (or spouse)	1	2	3	4	5	6	7	Causes problems in all areas of my life

Questions 2e-g ask for your views of and reactions to your not having a boy/girlfriend (or spouse) and not about the cause of your not having a boy/girlfriend (or spouse).

e. *How likely is it that your not having a boy/girlfriend (or spouse) will lead to other negative things happening to you? [Circle one number.]*

Not at all likely to lead to other negative things happening to me	1	2	3	4	5	6	7	Extremely likely to lead to other negative things happening to me.

f. *To what degree does your not having a boy/girlfriend (or spouse) mean to you that you are flawed in some way? [Circle one number.]*

Definitely does not mean I am flawed in some some way	1	2	3	4	5	6	7	Definitely does mean I am flawed in some way

g. *How important is it to you that you don't have a boy/girlfriend (or spouse)? [Circle one number].*

Not at all important	1	2	3	4	5	6	7	Extremely important

****

3. Imagine that the following sequence of events actually happens to you:

A friend comes to you with a problem, and you are not as helpful as you would like to be.

Questions 3a-d ask about the cause of your not being as helpful as you would like to be to your friend.

a. Write down the one major cause of your not being as helpful as you would like to be to your friend.

---

b. Is it something about you or something about other people or circumstances that caused your not being as helpful as you would like to be to your friend? [Circle one number.]

Totally caused by other people or circumstances	1	2	3	4	5	6	7	Totally caused by me

c. In the future when a friend comes to you with a problem, will the cause of your not being as helpful as you would like to be to your friend now also cause you to not be as helpful as you would like to be to your friend then? [Circle one number.]

Will never again cause me to not be as helpful as I would like to be	1	2	3	4	5	6	7	Will always cause me to not be as helpful as I would like to be

d. Is the cause of your not being as helpful as you would like to be to your friend something that just causes problems in your helping friends, or does it also cause problems in other areas of your life? [Circle one number.]

Causes problems just in my helping friends	1	2	3	4	5	6	7	Causes problems in all areas of my life

Questions 3e-g ask for your views of and reactions to your not being as helpful as you would like to be to your friend and not about the cause of your not being as helpful as you would like to be to your friend.

e. How likely is it that your not being as helpful as you would like to be to your friend will lead to other negative things happening to you? [Circle one number.]

Not at all likely to lead to other negative things happening to me	1	2	3	4	5	6	7	Extremely likely to lead to other negative things happening to me.

f. To what degree does your not being as helpful as you would like to be to your friend mean to you that you are flawed in some way? [Circle one number.]

Definitely does not mean I am flawed in some some way	1	2	3	4	5	6	7	Definitely does mean I am flawed in some way

g. How important is it to you that you are not being as helpful as you would like to be to your friend? [Circle one number].

Not at all important	1	2	3	4	5	6	7	Extremely important

****

4. Imagine that the following sequence of events actually happens to you:

As an assignment, you give an important talk in class, and the class reacts negatively.

Questions 4a-d ask about the cause of the class reacting negatively to your talk.

a. Write down the one major cause of the class reacting negatively to your talk.

_____

b. Is it something about you or something about other people or circumstances that caused the class to react negatively to your talk? [Circle one number.]

Totally caused by other people or circumstances	1	2	3	4	5	6	7	Totally caused by me

c. In the future when you give important talks in class, will the cause of the class reacting negatively to your talk now also cause the class to react negatively to your talk then? [Circle one number.]

Will never again cause the class to react negatively to my talks	1	2	3	4	5	6	7	Will always cause the class to react negatively to my talks

d. Is the cause of the class reacting negatively to your talk something that just causes problems when you give talks, or does it also cause problems in other areas of your life? [Circle one number.]

Causes problems just when I give talks	1	2	3	4	5	6	7	Causes problems in all areas of my life

Questions 4e-g ask for your views of and reactions to the class reacting negatively to your talk and <u>not</u> about the cause of the class reacting negatively to your talk.

e. *How likely is it that the class reacting negatively to your talk will lead to other negative things happening to you? [Circle one number.]*

Not at all likely to lead to other negative things happening to me	1	2	3	4	5	6	7	Extremely likely to lead to other negative things happening to me.

f. To what degree does the class reacting negatively to your talk mean to you that you are flawed in some way? [Circle one number.]

Definitely does not mean I am flawed in some some way	1	2	3	4	5	6	7	Definitely does mean I am flawed in some way

g. *How important is it to you that the class reacted negatively to your talk? [Circle one number].*

Not at all important	1	2	3	4	5	6	7	Extremely important

****

5. Imagine that the following sequence of events <u>actually</u> happens to you:

Your parents have been treating you in a negative way.

Questions 5a-d ask about the <u>cause</u> of your parents treating you in a negative way.

a. Write down the <u>one</u> major cause of your parents treating you in a negative way

_____

b. Is it something about you or something about other people or circumstances that caused your parents to treat you in a negative way? [Circle one number.]

Totally caused by other people or circumstances	1	2	3	4	5	6	7	Totally caused by me

c. In the future when interacting with your parents, will the cause of your parents treating you in a negative way now also cause your parents to treat you in a negative way then? [Circle one number.]

Will never again cause my parents to treat me in a negative way	1	2	3	4	5	6	7	Will always cause my parents to treat me in a negative way

d. Is the cause of your parents treating you in a negative way something that just causes problems when you interact with them, or does it also cause problems in other areas of your life? [Circle one number.]

Causes problems just when I interact with my parents	1	2	3	4	5	6	7	Causes problems in all areas of my life

Questions 5e-g ask for your views of and reactions to your parents treating you in a negative way and <u>not</u> about the cause of your parents treating you in a negative way.

e. How likely is it that your parents treating you in a negative way will lead to other negative things happening to you? [Circle one number.]

Not at all likely to lead to other negative things happening to me	1	2	3	4	5	6	7	Extremely likely to lead to other negative things happening to me.

f. To what degree does your parents treating you in a negative way mean to you that you are flawed in some way? [Circle one number.]

Definitely does not mean I am flawed in some some way	1	2	3	4	5	6	7	Definitely does mean I am flawed in some way

g. How important is it to you that your parents treat you in a negative way? [Circle one number].

Not at all important	1	2	3	4	5	6	7	Extremely important

****

6. Imagine that the following sequence of events actually happens to you:

Your gradepoint average (GPA) for the semester is low.

Questions 6a-d ask about the cause of your low gradepoint average (GPA) for the semester.

a. Write down the <u>one</u> major cause of your low gradepoint average (GPA) for the semester.

---

b. Is it something about you or something about other people or circumstances that caused your low gradepoint average (GPA) for the semester? [Circle one number.]

Totally caused by other people or circumstances	1	2	3	4	5	6	7	Totally caused by me

c. In the future when you receive your grades for a semester will the cause of this semester's low gradepoint average (GPA) also cause other semesters' gradepoint averages (GPA's) of yours to be low? [Circle one number.]

Will never again cause my semester gradepoint averages (GPA's) to be low	1	2	3	4	5	6	7	Will always cause my semester gradepoint averages (GPA's) to be low

d. Is the cause of your low gradepoint average (GPA) for the semestersomething that just causes problems in your grades, or does it also cause problems in other areas of your life? [Circle one number.]

Causes problems just in my grades	1	2	3	4	5	6	7	Causes problems in all areas of my life

Questions 6e-g ask for your views of and reactions to your low gradepoint average (GPA) for the semester and not about the cause of your low gradepoint average (GPA) for the semester.

e. How likely is it that your low gradepoint average (GPA) for the semester will lead to other negative things happening to you? [Circle one number.]

Not at all likely to lead to other negative things happening to me	1	2	3	4	5	6	7	Extremely likely to lead to other negative things happening to me.

f. To what degree does your low gradepoint average (GPA) for the semester mean to you that you are flawed in some way? [Circle one number.]

Definitely does not mean I am flawed in some some way	1	2	3	4	5	6	7	Definitely does mean I am flawed in some way

g. How important is it to you that your gradepoint average (GPA) for the semester is low? [Circle one number].

Not at all important	1	2	3	4	5	6	7	Extremely important

****

7. Imagine that the following sequence of events actually happens to you:

At a party, people don't act interested in you.

Questions 7a-d ask about the cause of people not acting interested in you at the party.

a. Write down the one major cause of people not acting interested in you at the party.

b. Is it something about you or something about other people or circumstances that caused people to not act interested in you at the party? [Circle one number.]

Totally caused by other people or circumstances	1	2	3	4	5	6	7	Totally caused by me

c. In the future when at parties, will the cause of people not acting interested in you at this party also cause people to not act interested in you at other parties? [Circle one number.]

Will never again cause people to not act interested in me at parties	1	2	3	4	5	6	7	Will always cause people to not act interested in me at parties

d. Is the cause of people not acting interested in you at the party something that just causes problems at parties, or does it also cause problems in other areas of your life? [Circle one number.]

Causes problems just in my interactions at parties	1	2	3	4	5	6	7	Causes problems in all areas of my life

Questions 7e-g ask for your views of and reactions to your low gradepoint average (GPA) for the semester and <u>not</u> about the cause of your low gradepoint average (GPA) for the semester.

e. How likely is it that people not acting interested in you at the party will lead to other negative things happening to you? [Circle one number.]

Not at all likely to lead to other negative things happening to me	1	2	3	4	5	6	7	Extremely likely to lead to other negative things happening to me.

f. To what degree does people not acting interested in you at the party mean to you that you are flawed in some way? [Circle one number.]

Definitely does not mean I am flawed in some some way	1	2	3	4	5	6	7	Definitely does mean I am flawed in some way

h. How important is it to you that at a party, people don't act interested in you? [Circle one number].

Not at all important	1	2	3	4	5	6	7	Extremely important

****

8. Imagine that the following sequence of events actually happens to you:

You can't get all the work done that others expect of you.

Questions 8a-d ask about the <u>cause</u> of your not getting all the work done that others expect of you.

a. Write down the <u>one</u> major cause of your not getting all the work done that others expect of you.

_____

b. Is it something about you or something about other people or circumstances that caused your not getting all the work done that others expect of you? [Circle one number.]

Totally caused by other people or circumstances	1	2	3	4	5	6	7	Totally caused by me

c. In the future when doing the work that others expect, will the cause your not getting all the work done that others expect of you now also cause you to not get all the work done then? [Circle one number.]

Will never again cause me to not get all the work done	1	2	3	4	5	6	7	Will always cause me to not get all the work done

d. Is the cause of your not getting all the work done that others expect of you something that just causes problems in your getting the work done that others expect, or does it also cause problems in other areas of your life? [Circle one number.]

Causes problems just in getting the work done that others expect	1	2	3	4	5	6	7	Causes problems in all areas of my life

Questions 8e-g ask for your views of and reactions to your not getting all the work done that others expect of you and <u>not</u> about the cause of your not getting all the work done that others expect of you.

e. How likely is it that your not getting all the work done that others expect of you will lead to other negative things happening to you? [Circle one number.]

Not at all likely to lead to other negative things happening to me	1	2	3	4	5	6	7	Extremely likely to lead to other negative things happening to me.

f. To what degree does your not getting all the work done that others expect of you mean to you that you are flawed in some way? [Circle one number.]

Definitely does not mean I am flawed in some some way	1	2	3	4	5	6	7	Definitely does mean I am flawed in some way

g. How important is it to you that you can't get all the work done that others expect of you? [Circle one number].

Not at all important	1	2	3	4	5	6	7	Extremely important

****

9. Imagine that the following sequence of events actually happens to you:

You apply for admission into graduate or professional schools but don't get accepted at any you want to attend.

Questions 9a-d ask you about the cause of your not getting accepted at any of the graduate or professional schools you want to attend.

a. Write down the one major cause of your not getting accepted at any of the graduate or professional schools you want to attend.

_____

b. Is it something about you or something about other people or circumstances that caused your not getting accepted at any of the graduate or professional schools you want to attend? [Circle one number.]

Totally caused by other people or circumstances	1	2	3	4	5	6	7	Totally caused by me

c. In the future when applying for admission into graduate or professional schools, will the cause of your not getting accepted at any of the graduate or professional schools you want to attend now also cause you to not get accepted at any of the graduate or professional schools you want to attend then? [Circle one number.]

Will never again cause me to not get accepted at the graduate or professional schools I want to attend	1	2	3	4	5	6	7	Will always cause me to not get accepted at the graduate or professional schools I want to attend

d. Is the cause of your not getting accepted at any of the graduate or professional schools you want to attend something that just causes problems in your getting accepted at graduate or professional schools you want to attend, or does it also cause problems in other areas of your life? [Circle one number.]

Causes problems just in getting accepted at graduate or professional schools I want to attend	1	2	3	4	5	6	7	Causes problems in all areas of my life

Questions 9e-g ask for your views of and reactions to your not getting accepted at any of the graduate or professional schools you want to attend and not about the cause of your not being accepted.

e. How likely is it that your not getting accepted at any of the graduate or professional schools you want to attend will lead to other negative things happening to you? [Circle one number.]

Not at all likely to lead to other negative things happening to me	1	2	3	4	5	6	7	Extremely likely to lead to other negative things happening to me.

f. To what degree does your not getting accepted at any of the graduate or professional schools you want to attend mean to you that you are flawed in some way? [Circle one number.]

Definitely does not mean I am flawed in some some way	1	2	3	4	5	6	7	Definitely does mean I am flawed in some way

g. How important is it to you that you don't get accepted at any of the graduate or professional schools you want to attend? [Circle one number].

Not at all important	1	2	3	4	5	6	7	Extremely important

****

10. Imagine that the following sequence of events actually happens to you:

During the first year of working in the career of your choice, you receive a negative evaluation of your job performance from your employer.

Questions 10a-d ask about the cause of the negative evaluation of your job performance from your employer.

a. Write down the one major cause of the negative evaluation of your job performance from your employer.

---

b. Is it something about you or something about other people or circumstances that caused the negative evaluation of your job performance from your employer? [Circle one number.]

Totally caused by other people or circumstances	1	2	3	4	5	6	7	Totally caused by me

c. In the future when your job performance in the career of your choice is evaluated, will the cause of this negative job evaluation also cause other job evaluations to be negative? [Circle one number.]

Will never again cause my job evaluations to be negative	1	2	3	4	5	6	7	Will always cause my job evaluations to be negative

d. Is the cause of the negative evaluation of your job performance from your employer something that just causes problems in your job evaluations in the career of your choice, or does it also cause problems in other areas of your life? [Circle one number.]

Causes problems just in my job performance in the career of my choice	1	2	3	4	5	6	7	Causes problems in all areas of my life

Questions 10e-g ask for your views of and reactions to the negative evaluation of your job performance from your employer and not about the cause of the negative evaluation of your job performance from your employer.

e. How likely is it that the negative evaluation of your job performance from your employer will lead to other negative things happening to you? [Circle one number.]

Not at all likely to lead to other negative things happening to me	1	2	3	4	5	6	7	Extremely likely to lead to other negative things happening to me.

f. To what degree does the negative evaluation of your job performance from your employer mean to you that you are flawed in some way? [Circle one number.]

Definitely does not mean I am flawed in some some way	1	2	3	4	5	6	7	Definitely does mean I am flawed in some way

g. How important is it to you that during the first year of working in the career of your choice, you receive a negative evaluation of your job performance from your employer? [Circle one number].

Not at all important	1	2	3	4	5	6	7	Extremely important

****

11. Imagine that the following sequence of events actually happens to you:

Your relationship with your boy/girlfriend (or spouse) ends even though you would like it to continue.

Questions 11a-d ask about the cause of your relationship with your boy/girlfriend (or spouse) ending even though you would like it to continue.

a. Write down the one major cause of your relationship with your boy/girlfriend (or spouse) ending even though you would like it to continue

_____

b. Is it something about you or something about other people or circumstances that caused your relationship with your boy/girlfriend (or spouse) to end even though you would like it to continue? [Circle one number.]

Totally caused by other people or circumstances	1	2	3	4	5	6	7	Totally caused by me

c. In the future when you are involved in a relationship, will the cause your relationship with your boy/girlfriend (or spouse) ending now also cause other relationships with boy/girlfriends (or spouses) to end even though you would like them to continue? [Circle one number.]

Will never again cause my relationships with boy/girl-friends (or spouses) to end	1	2	3	4	5	6	7	Will always cause my relationships with boy/girl-friends (or spouses) to end

d. Is the cause of your relationship with your boy/girlfriend (or spouse) ending even though you would like it to continue something that just causes problems in your relationships, or does it also cause problems in other areas of your life? [Circle one number.]

Causes problems just in my relationships	1	2	3	4	5	6	7	Causes problems in all areas of my life

Questions 11e-g ask for your views of and reactions to your relationship with your boy/girlfriend (or spouse) ending even though you would like it to continue and not about the cause of your relationship with your boy/girlfriend (or spouse) ending even though you would like it to continue.

e. How likely is it that the ending of your relationship with your boy/girlfriend (or spouse) will lead to other negative things happening to you? [Circle one number.]

Not at all likely to lead to other negative things happening to me	1	2	3	4	5	6	7	Extremely likely to lead to other negative things happening to me.

f. To what degree does your relationship with your boy/girlfriend (or spouse) ending even though you would like it to continue mean to you that you are flawed in some way? [Circle one number.]

Definitely does not mean I am flawed in some some way	1	2	3	4	5	6	7	Definitely does mean I am flawed in some way

g. How important is it to you that your relationship with your boy/girlfriend (or spouse) ends even though you would like it to continue? [Circle one number].

Not at all important	1	2	3	4	5	6	7	Extremely important

****

12. Imagine that the following sequence of events actually happens to you:

A person with whom you really want to be friends does not want to be friends with you.

Questions 12a-d ask about the cause of the person not wanting to be friends with you.

a. Write down the one major cause of the person not wanting to be friends with you

---

b. Is it something about you or something about other people or circumstances that caused the person to not want to be friends with you? [Circle one number.]

Totally caused by other people or circumstances	1	2	3	4	5	6	7	Totally caused by me

c. In the future when you want to be friends with someone, will the cause of this person not wanting to be friends with you also cause other people to not want to be friends with you? [Circle one number.]

Will never again cause other people to not want to be friends with me	1	2	3	4	5	6	7	Will always cause other people to not want to be friends with me

d. Is the cause of the person not wanting to be friends with you something that just causes problems in your making friends, or does it also cause problems in other areas of your life? [Circle one number.]

Causes problems just in my making friends	1	2	3	4	5	6	7	Causes problems in all areas of my life

Questions 12e-g ask for your views of and reactions to the person not wanting to be friends with you and <u>not</u> about the cause of the person not wanting to be friends with you.

e. How likely is it that the person not wanting to be friends with you will lead to other negative things happening to you? [Circle one number.]

Not at all likely to lead to other negative things happening to me	1	2	3	4	5	6	7	Extremely likely to lead to other negative things happening to me.

f. To what degree does the person not wanting to be friends with you mean to you that you are flawed in some way? [Circle one number.]

Definitely does not mean I am flawed in some some way	1	2	3	4	5	6	7	Definitely does mean I am flawed in some way

g. How important is it to you that person with whom you really want to be friends does not want to be friends with you? [Circle one number].

Not at all important	1	2	3	4	5	6	7	Extremely important

Appendix 5: The Response Styles Questionnaire

People think and do many different things when they feel sad, blue, or depressed. Please read each of the items below and indicate whether you never, sometimes, often, or always think or do each one when you feel sad, down, or depressed. Please indicate what you generally do, not what you think you should do.

Rating Scale Items	Never	Sometimes	Often	Always
1. Ask someone to help you overcome a problem.	1	2	3	4
2. Think about how alone you feel.	1	2	3	4
3. Think "I won't be able to do my job/work because I feel so badly."	1	2	3	4
4. Think about your feelings of fatigue and achiness.	1	2	3	4
5. Think about how hard it is to concentrate.	1	2	3	4
6. Try to find something positive in the situation or something you learned.	1	2	3	4
7. Take recreational drugs or drink alcohol.	1	2	3	4
8. Think "I'm going to do something to make myself feel better".	1	2	3	4
9. Help someone else with something in order to distract yourself.	1	2	3	4
10. Think about how passive and unmotivated you feel.	1	2	3	4
11. Remind yourself that these feelings won't last.	1	2	3	4
12. Analyze recent events to try to understand why you are depressed.	1	2	3	4
13. Think about how you don't seem to feel anything any more.	1	2	3	4
14. Think "Why can't I get going?"	1	2	3	4
15. Think "Why do I always react this way?"	1	2	3	4
16. Go to a favourite place to get your mind off your feelings.	1	2	3	4
17. Go away by yourself and think about why you feel this way.	1	2	3	4
18. Talk it out with someone whose opinions you respect (friend/family/ clergy).	1	2	3	4
19. Think "I'll concentrate on something other than how I feel."	1	2	3	4
20. Write down what you are thinking about and analyze it.	1	2	3	4
21. Do something that has made you feel better in the past.	1	2	3	4
22. Think about a recent situation, wishing it had gone better.	1	2	3	4
23. Think "I'm going to go out and have some fun."	1	2	3	4

Rating Scale Items	Never	Sometimes	Often	Always
24. Make a plan to overcome a problem.	1	2	3	4
25. Stay around people.	1	2	3	4
26. Concentrate on your work.	1	2	3	4
27. Think "Why do I have problems other people don't have?"	1	2	3	4
28. Do something reckless or dangerous.	1	2	3	4
29. Think about how sad you feel.	1	2	3	4
30. Think about all your shortcomings, failings, faults, mistakes.	1	2	3	4
31. Do something you enjoy.	1	2	3	4
32. Think about how you don't feel up to doing anything.	1	2	3	4
33. Do something fun with a friend.	1	2	3	4
34. Analyze your personality to try to understand why you are depressed.	1	2	3	4
35. Take your feelings out on someone else.	1	2	3	4
36. Go someplace alone to think about your feelings.	1	2	3	4
37. Deliberately do something to make yourself feel worse.	1	2	3	4
38. Think about how angry you are with yourself.	1	2	3	4
39. Listen to sad music.	1	2	3	4
40. Isolate yourself and think about the reasons why you feel sad.	1	2	3	4
41. Try to understand yourself by focusing on your depressed feelings.	1	2	3	4

Appendix 6: The Winter Stress Scale

Please respond to the questions below and write clearly.

---

1. How much do you dread the winter?

1	2	3	4	5
not at all	a little	moderately	very	extremely

- *Please explain your answer:*

---

2. Some people experience certain changes in themselves during the winter. If you experience these changes as well, please rate how stressful they are for you.

CHANGES	0 does not apply	1 not stressful at all	2 quite stressful	3 moderately stressful	4 very stressful	5 extremely stressful
Carbohydrate craving	0	1	2	3	4	5
Weight gain	0	1	2	3	4	5
Energy loss	0	1	2	3	4	5
Increased sleep	0	1	2	3	4	5
Other (please specify below):	0	1	2	3	4	5

Please provide additional information below to help us understand better your experience with the changes (where applicable):

3. *To what degree do the winter changes (the ones that you endorsed in question 2) interfere with your ability to cope with daily life difficulties in your life (i.e., work, academic, social, family, and personal)?*

1	2	3	4	5
not at all	a little	moderately	very	extremely

Please explain your answer:

4. How often do you engage in the following behaviour? Please use the rating scale below to answer the questions.

1	2	3	4	5
	never	rarely	sometimes	often	always

(a) During the winter I find myself thinking about how any changes in mood and behavior that I experience may (or actually do) affect my life. _____

(b) During the fall/winter I find myself wishing that I could go outside more. _____

(c) During the fall/winter I think about how I never seem to have enough energy to do what I can during the summer. _____

(d) During the fall/winter I think things like, "I won't be able to do job/work because I feel so bad". _____

(e) During the fall/winter I find myself thinking about how any changes in mood in behavior that I am experiencing affect my life. _____

(f) During the fall/winter I wish that I felt more like I do during the summer. _____

5. Please answer the questions using the rating scale given below:

1	2	3	4	5
disagree strongly	disagree	neutral	agree	agree strongly

During the fall and/or winter:

- (a) I get more upset than usual because of something that happened unexpectedly _____
- (b) I am less able to control the important things in my life _____
- (c) I feel more nervous and "stressed" than usual _____
- (d) I am more successful than usual at dealing with irritating life hassles _____
- (e) I cope more effectively than usual with important changes that are occurring in my life _____
- (f) I am more confident than usual about my ability to handle my personal problems _____
- (g) I feel more than usual that things go my way _____
- (h) I am less able to cope than usual with things that I have to do _____
- (i) I am less able than usual to control irritations in my life _____

- (j) I feel more on top of things than usual _____
- (k) I get more angry than usual because of things that happen that are outside of my control _____
- (l) I think more than usual of things that I have to accomplish _____
- (m) I am more able to control the way I spend my time _____
- (n) I feel more so than usual that difficulties are piling up so high that I can not overcome them _____

Appendix 7: The Sociotropy-Autonomy Scale - Revised

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.

PERCENT DESCRIBES YOU

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.

PERCENT DESCRIBES YOU

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

PERCENT DESCRIBES YOU

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.

PERCENT DESCRIBES YOU

0%	25%	50%	75%	100%	
A	B	C	D	E	51. I need to be engaged in a challenging task in order to feel satisfied with my life.
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 8: Shipley Instititute of Living Scale

Section I: In the test below, the first word in each line is printed in capital letters. Opposite are four other words. Circle the one word that means the same thing, or most nearly the same thing, as the first word. If you don't know, guess. Be sure to circle the one word in each line that means the same thing as the first word.

EXAMPLE: LARGE red (big) silent wet

1.	TALK	draw	eat	speak	sleep
2.	PERMIT	allow	sew	cut	drive
3.	PARDON	forgive	pound	divide	tell
4.	COUCH	pin	eraser	sofa	glass
5.	REMEMBER	swim	recall	number	defy
6.	TUMBLE	drink	dress	fall	think
7.	HIDEOUS	silvery	tilted	young	dreadful
8.	CORDIAL	swift	muddy	leafy	hearty
9.	EVIDENT	green	obvious	skeptical	afraid
10.	IMPOSTER	conductor	officer	book	pretender
11.	MERIT	deserve	distrust	fight	separate
12.	FASCINATE	welcome	fix	stir	enchant
13.	INDICATE	defy	excite	signify	bicker
14.	IGNORANT	red	sharp	uninformed	precise
15.	FORTIFY	submerge	strengthen	vent	deaden
16.	RENOWN	length	head	fame	loyalty
17.	NARRATE	yield	buy	associate	tell
18.	MASSIVE	bright	large	speedy	low
19.	HILARITY	laughter	speed	grace	malice
20.	SMIRCHED	stolen	pointed	remade	soiled
21.	SQUANDER	tease	belittle	cut	waste
22.	CAPTION	drum	ballast	heading	ape
23.	FACILITATE	help	turn	strip	bewilder
24.	JOCOSE	humorous	paltry	fervid	plain
25.	APPRISE	reduce	strew	inform	delight
26.	RUE	eat	lament	dominate	cure
27.	DENIZEN	senator	inhabitant	fish	atom
28.	DIVEST	dispossess	intrude	rally	pledge
29.	AMULET	charm	orphan	dingo	pond
30.	INEXORABLE	untidy	involatile	rigid	sparse
31.	SERRATED	dried	notched	armed	blunt
32.	LISSOM	moldy	loose	supple	convex
33.	MOLLIFY	mitigate	direct	pertain	abuse
34.	PLAGIARIZE	appropriate	intend	revoke	maintain
35.	ORIFICE	brush	hole	building	lute
36.	QUERULOUS	maniacal	curious	devout	complaining
37.	PARIAH	outcast	priest	lentil	locker
38.	ABET	waken	ensue	incite	placate
39.	TEMERITY	rashness	timidity	desire	kindness
40.	PRISTINE	vain	sound	first	level

Appendix 9: Word Rating Scale

Greetings! We are conducting a pilot study to find words that represent three concepts. Provided below are 3 lists of words, one list for each concept. Each word needs to be rated on the degree of their representativeness of the concept. Based on your responses, a subset of words will be selected that best represent the three concepts for use in a future research project. Your responses will be kept confidential and anonymous as we are not collecting any names. If you have any questions, please ask the experimenter. If you wish to know the results of this pilot study, please provide your name on a separate piece of paper. Thank you for your assistance – it is very much appreciated!

Please answer these questions for demographic purposes:

Sex: Male / Female Age: ____

Program type: MA / PhD Which year level of your program are you in? _____

A. CONCEPT – FALL/WINTER:

*Instructions: How much does each word represent or remind you of the **FALL/WINTER**?*

0 1 2 3 4 5 6 7 8 9

does not remind me of fall/winter at all — *reminds me exactly of fall/winter*

November	_____	Snowball	_____
Winter	_____	Shoveled	_____
Freeze	_____	Snowstorm	_____
Snow	_____	Snowflake	_____
Ice	_____	Icicle	_____
Slush	_____	Slippery	_____
Frost	_____	Snowball	_____
Shivers	_____	Shiver	_____
Flurries	_____	Chill	_____
December	_____	Coldest	_____
Blizzard	_____	Darkening	_____
Cloudy	_____	Rain	_____
January	_____	February	_____
Seasonal	_____	Season	_____
Dark	_____	Shiver	_____
Hail	_____	Frostbite	_____
Frozen	_____	Darker	_____
Autumn	_____	Snowed	_____
Chills	_____	Chilly	_____
Arctic	_____	Breeze	_____
Snowfall	_____	Frigid	_____
September	_____	Forecasts	_____
Breezy	_____	Hails	_____
Rain	_____	Storm	_____
August	_____	Shivered	_____
Seasonal	_____		

B. CONCEPT – DEPRESSION EXPERIENCE:

Instructions: How much does each word represent or remind you of the EXPERIENCE OF DEPRESSION? Some hints include the following considerations. How a depressed person may view others, how the depressed person may view him/herself, how the depressed person may view the future. Other examples include what the depressed person might experience during a depressive episode and how s/he think others may feel about them. Please use this rating scale:

0 1 2 3 4 5 6 7 8 9

does not remind me of the depression experience at all ... *reminds me exactly of the depression experience*

Cruelly	_____	Uglier	_____
Criticize	_____	Suicides	_____
Taunted	_____	Unfairly	_____
Inferior	_____	Lonely	_____
Dreary	_____	Rumours	_____
Needy	_____	Rude	_____
Abnormal	_____	Immature	_____
Pain	_____	Hopeless	_____
Hating	_____	Inept	_____
Blaming	_____	Idiot	_____
Downcast	_____	Dependent	_____
Arrogant	_____	Disloyal	_____
Unlucky	_____	Stupid	_____
Lies	_____	Odd	_____
Hate	_____	Dependency	_____
Helplessly	_____	Powerless	_____
Shamed	_____	Loser	_____
Unusual	_____	Struggle	_____
Lie	_____	Afraid	_____
Struggle	_____	Sensitive	_____
Lose	_____	Tension	_____
Shameful	_____	Cynically	_____
Aggravate	_____	Irritable	_____
Childlike	_____	Burdened	_____
Condemn	_____	Cynicism	_____
Anguished	_____	Aggressor	_____
Tearfulness	_____	Aloneness	_____
Annoy	_____	Broody	_____
Craven	_____	Downcast	_____
Exiled	_____	Bugged	_____
Boring	_____	Aloof	_____
Dismay	_____	Abused	_____
Aloof	_____	Hardships	_____
Helplessness	_____	Isolating	_____
Irritating	_____	Ridicule	_____
Victim	_____	Injury	_____
Cried	_____	Anxious	_____
Argued	_____	Guilty	_____
Hated	_____	Hated	_____
Losing	_____	Enemies	_____

0 1 2 3 4 5 6 7 8 9

does not remind me of the depression experience at all ... *reminds me exactly of the depression experience*

Tension	_____	Worry	_____
Conflict	_____	Negative	_____
Upset	_____	Loners	_____
Unsure	_____	Lament	_____
Weird	_____	Homely	_____
Lazy	_____	Tear	_____
Doomed	_____	Meek	_____
Reject	_____	Fake	_____
Scar	_____	Evil	_____
Gross	_____	Empty	_____
Doubt	_____	Poor	_____
Stress	_____	Critics	_____
Critic	_____	Nervous	_____
Loathsome	_____	Deceptive	_____
Disapprove	_____	Irritating	_____
Jealousy	_____	Cruelly	_____
Hates	_____	Dislikes	_____
Critic	_____	Stressed	_____
Bother	_____	Nerves	_____

C: CONCEPT – NEUTRAL

Instructions: In this list, we are trying to find words that are UNRELATED to both the fall/winter concept and the depression experience concept. Please rate each word according to how representative you find it to be of either or both the fall/winter concept and the depression experience concept. Please rate them on the following scale:

0 1 2 3 4 5 6 7 8 9

does not remind me at all of fall/winter concept and/or the depression experience concept ... *reminds me exactly of the fall/winter concept and/or the depression experience concept*

Corner	_____	Thickets	_____
Terraces	_____	Folded	_____
Balloons	_____	Structure	_____
Pile	_____	Statue	_____
Washer	_____	Shrugs	_____
Splits	_____	Purports	_____
Pullover	_____	Overhand	_____
Exact	_____	Diameter	_____
Includes	_____	Includes	_____
Sum	_____	Cup	_____
Peaceable	_____	Resolving	_____
Glean	_____	Glows	_____
Heaps	_____	Gloss	_____

0 1 2 3 4 5 6 7 8 9

does not remind me at all of fall/winter concept and/or the depression experience concept

reminds me exactly of the fall/winter concept and/or the depression experience concept

Internal	_____	Speaking	_____
Drop	_____	Roof	_____
Shipment	_____	Skylights	_____
Biscuits	_____	Skippers	_____
Squadrons	_____	Signified	_____
Bestow	_____	Eraser	_____
Blends	_____	Edging	_____
Clothed	_____	Entail	_____
Exempt	_____	Clutch	_____
Drains	_____	Therefrom	_____
Leisurely	_____	Librarian	_____
Longhorns	_____	Thickened	_____
Define	_____	Excuse	_____
Holder	_____	Passes	_____
Handle	_____	Minute	_____
Examples	_____	Thread	_____
Levied	_____	Akin	_____
Echo	_____	Easily	_____
Station	_____	Mount	_____
Early	_____	Basing	_____
Bluffs	_____	Doubly	_____
Eastward	_____	Fountains	_____
Empire	_____	Freely	_____

Thank you so much for your help! If you wish to know the results of this pilot study, please forward your name on a separate piece of paper to the experimenter.

Appendix 10: Cover Letter

Research Questionnaire (for Intro Psych 2003-2004)

Name of project: Attitudes and Behaviours Across Seasons
Researcher: Rob Dew (sadstudy1@hotmail.com), 343-8976
Project Supervisor: Dr. Josephine Tan (346-7751)

Information on the Study:

This study compares individuals with winter blues with those who are not depressed on their emotional, cognitive, and behavioural experiences at different times of the year. All participants must be at least 18 years old. Overall, there will be three stages to this study. This questionnaire represents Stage 1. Participating in Stage 1 does not in any way commit you to participate in Stages 2 and 3. For your information, the 3 stages are as follows:

(a) *Stage 1*: This is Stage 1. All you have to do is to complete this small questionnaire. It will take only 5-10 minutes, and for your efforts, you will be entered into three (3) $50 random prize draws. Participating in Stage 1 does not obligate you to participate in Stage 2. If you would like to be involved in Stage 2, there is a section in this Research Questionnaire that asks you to indicate your interest.

(b) *Stage 2*: If you indicate an interest in Stage 2, you might be invited to participate in it, depending on your scores in Stage 1. If you are chosen, we will contact you. Stage 2 will take 1 hour. You will be asked to complete another questionnaire, possibly participating in a short interview to clarify some of your responses, and engaging in a computerized task. The researcher will be there at all times to guide you through the process. For your assistance in Stage 2, you will either receive 1 bonus point towards your course marks or be entered into three (3) $100 random prize draws. You will be asked to indicate your preference. Participating in Stage 2 does not compel you to participate in Stage 3.

(c) *Stage 3*: Everyone who participates in Stage 2 will be invited to participate in Stage 3 (50 minutes long) for a re-testing at a later time during the spring or summer. You are free to decline the invitation if you so choose. The procedure for Stage 3 is identical to the one for Stage 2, and will take 50-60 minutes. If you are involved in Stage 3, you will receive a $10 honorarium.

All Stage 2 and 3 sessions will be run on an individual basis with the researcher guiding the process and providing explicit instructions. Sessions will be scheduled at a time that is convenient to you. All responses collected in the 3 stages are kept confidential. Your participation in all 3 stages is voluntary, which means you can drop out of the study any time you wish. A summary of the results of the study when it has been completed will be shared with you if so request. The data will be kept securely in Dr. Tan's lab at Lakehead University for 7 years after which time it will be destroyed. There is no risk or benefit to you for participating in any stage of the study.

By completing this questionnaire, you are participating in Stage 1. Please return your completed questionnaire as soon as possible to a box marked "Attitudes and Behaviors Across Seasons" that is located in SN 1042. Thank you.

Robert Dew, M.A. Dr. Josephine Tan

Appendix 11: Introductory Psychology Student Screening Informed Consent Sheet

INFORMED CONSENT FORM

(for Screening in Introductory Psychology classes)

1. Title of research: Attitudes and Behaviors Across Seasons

2. This study is open to individuals who are between the ages of 18 and 55. It compares individuals with winter blues and those who are nondepressed on their emotional, cognitive, and behavioural experiences at two different times.

3. There will be three stages to this study. Stage 1 includes the completion of this small questionnaire. In return for completing this questionnaire, you will be entered into three $50 draws. The questionnaire should take 5 to 10 minutes to complete. Stage 2 includes completing another questionnaire, participating in a computerized task, and possibly an interview. The second stage should take one hour to complete. In return for completing the second stage, you will receive 1 bonus point or you will be entered into three (3) $100 draws, depending on your preference. Stage 3 consists of another questionnaire and computerized task. In return for completing Stage 3, you will receive an honorarium of $10. The third stage should take approximately 50-60 minutes to complete. Participation in the earlier stages of this study in no way obligates you to participate in later stages of the study.

3. By completing this attached questionnaire, you are participating in Stage 1 which is designed to select people for Stages 2 and 3. Your participation is strictly voluntary. This means that you are free to withdraw from the study at any time without explanation or penalty, and can decline from Stages 2 and 3 if you wish. 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 (please complete the next page).

4. 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 ages of 18-55.

_____ _____

Print your name here Your signature

_____

Date

Please answer the following important questions:

1. In return for participating in Stage 1 where you complete the attached questionnaire, you will be entered into three (3) $50 prize draws. How may we contact you if you win the draw? Please provide an address, telephone number, and email address (if available) below:

2. Depending on your answers to the attached questionnaire, you might be invited to Stage 2 of the study. Do you wish to be called in for Stage 2 of the study if you are selected?

_____ *Yes*

_____ *No*

3. If you wish to be called in for Stage 2 of the study, please give us your contact information below. Do note that if you are leaving town within 1 week of your dropping off the questionnaire to us, we will need your out-of-town telephone number as well.

My tel # in Thunder Bay is: _____

My tel # out of town is: _____

My email address is: _____

4. The study (all 3 stages) will be completed and analyzed in the winter of 2006. Do you wish to receive a copy of the results? If yes, please give us your permanent mailing address:

Address: _____

_____

_____

Postal code: _____

Appendix 12: Thunder Bay Mental Health Resources Sheet

Mental Health Resource Sheet

If you wish to contact a mental health practitioner for any reason please consider the resources listed below:

- Lakehead University Health and Counselling Centre (for LU students): 343-8361
- Family Services Thunder Bay: 626-1880
- Catholic Family Development Centre: 345-7323
- Emergency services are available at the Thunder Bay Regional Hospital (McKellar site)
- Thunder Bay Crisis Response (24 hours): 346-8282.

Please keep this page for your own information.

Appendix 13: Recruitment Debriefing Form

Recruitment Debriefing Form

We would like to thank you for completing this questionnaire which forms Stage 1 of the study. Your name will be entered into 3 random draws of $50 each completing this questionnaire. We would like you to know that your participation is valued, but nonetheless, your participation in the second session is completely voluntary and you can withdraw from the study at any time without penalty or explanation.

This study was designed to compare individuals who have winter blues with those who are nondepressed on their behavior and cognitions at two different times of the year. By completing the research questionnaire, you have participated in the screening part (Stage 1) of the study. If your responses fulfill certain criteria we would appreciate your further participation. To do so, we will need to contact you at a later time.

This particular type of study is referred to as a longitudinal study. A longitudinal study measures something at two or more different times. This is different from a cross-sectional study that measures at one point in time. This study is also a prospective study because it measures something (for example, how people feel about an issue) at the time of the study. This is different from a retrospective study that relies on people recalling information that occurred before the time of study. A retrospective study would be open to memory bias as people's memory of how they felt before can be affected by many things. An advantage of a prospective longitudinal study such as this one is that it can assess certain factors across time without memory bias.

We are unable to provide specific details about the study at this point in order to protect its integrity. If people were to know exactly what we are investigating and what kinds of results we are expecting, their responses to Stage 2 and 3 might be influenced by this knowledge.

Therefore, it is important to us that we not release any specific information at this point in time about the research project. However, if you are interested in knowing more, please contact Robert Dew (343-3976) or Dr. Tan (346-7751) or e-mail Rob at sadstudy1@hotmail.com. We can note down your name and address and send you information about the study and its results once the study has been completed.

Thank you again very much for your help – it has been invaluable.

Appendix 14: Time 1 Research Consent Form

Time 1 Research Informed Consent Form

1. Title of research: Attitudes and Behaviours Across Seasons

2. This study is open to individuals who are between the ages of 18 and 55. It compares individuals with winter blues and those who are not depressed on their emotional, cognitive, and behavioural experiences at two different times.

3. There are two stages left in this study. This stage (Stage 2) includes completing a questionnaire, participating in a computerized task, and possibly participating in an interview. It will take one hour to complete. In return for completing Stage 2, you will be entered into three (3) $100 draws. If you are an Introductory Psychology student, you will have the choice of either the prize draws OR receiving 1 bonus point towards your course marks. The decision is yours to make. The final stage (Stage 3) is identical to this Stage 2 except that the questionnaire will be smaller. We will have to contact you for Stage 3, most likely by phone. In return for completing Stage 3 (50-60 minutes long), you will receive an honorarium of $10.

4. Your participation in this Stage 2 is strictly voluntary. You are free to withdraw from the study at any time without explanation or penalty. This also means you can decline from Stage 3 of the study if you wish. 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 (please see the next page).

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 18-55.

_____ _____

Print your name here Your signature

_____

Date

Please answer the following important questions:

1. If your are an Introductory Psychology student, would you like to receive 1 bonus point towards your course marks or be entered into the three $100 random prize draws? Please tick off one:

__ *Prize draws* (go to question #2)

__ *1 bonus point* (complete below and go to question #3):

What is your student ID #? _____

Who is your Introductory Psychology professor? _____

2. How may we contact you if you are a winner in the random prize draws?

My permanent tel # is: _____

My email address is: _____

3. Do you wish to be called in for Stage 3 of the study? This is so that we may compare your responses today in Stage 2 with your responses in Stage 3. Without Stage 3 responses, Stage 2 responses have less meaning to the study.

_____ *Yes*

_____ *No*

4. If you wish to be called in for Stage 3 of the study, and your contact information will change within the next 6 months, please give us your new contact information if you know it:

My current tel # in Thunder Bay is: _____

My new tel # will be: _____ *effective (date)* _____

My current email address is: _____

My new email address will be: _____

5. The study will be completed and analyzed in the winter of 2006. Do you wish to receive a copy of the results? If yes, please give us your permanent mailing address:

Address: _____

_____

_____

Postal code: _____

Appendix 15: Immediate Recall Task

During the computer task, you were presented with various words. Please write down as many words as you can below.

Appendix 16: Delayed Recall Task

Please write as many words as you can remember from the computerized task again in the lines below.

Appendix 17: Time 1 Debriefing Form

Time 1 Debriefing Form

We would like to thank you for completing the first research session (Stage 2) of this study. This study is designed to assess differences in the emotions, behavior and cognitions of individuals who have the winter blues and those who are not depressed at two different times. The questionnaires and the computerized task completed in this session measure behaviors and cognitions. If you are an Introductory Psychology student, either your name will be entered into 3 random draws worth $100 each or you will receive 1 bonus point towards your Introductory Psychology course mark for participating in this session, depending on your preference If you are not an Introductory Psychology student, you will have your name entered into 3 random draws of $100 for participating in this session.

There is still another session (Stage 3) to complete and we would highly appreciate your involvement in it so that we may compare your responses with the ones obtained from today. In the future session, the procedure is the same as today except that you will be asked to complete a shorter questionnaire. Everyone who comes in for the second session will be offered a $10 honorarium as a token of our gratitude. We will contact you for this second session, unless you have indicated otherwise in today's consent form. At any rate, we would like you to know that your participation is valued. If you have any questions, please ask the researcher at the present time or contact either Robert Dew (343-3976) or Dr. Tan (346-7751) at the phone number 343-3976 or e-mail Rob at sadstudy1@hotmail.com.

Appendix 18: Time 2 Research Consent Sheet

Research Session Time 2 Informed Consent Sheet

1. Title of research: Attitudes and Behaviours Across Seasons

2. This study is open to individuals who are between the ages of 18 and 55. It compares individuals with winter blues and those who are not depressed on their emotional, cognitive, and behavioural experiences at two different times.

3. In this final part of the study (Stage 3), you will be asked to complete a questionnaire that asks questions about your thoughts, emotions, and behaviours. You will also be asked to engage in a computerized task and might be asked to complete a short interview. Completion of the questionnaire typically takes about 30 minutes, completion of the interview (if administered) will take 15 minutes, and the computerized task should take 15 minutes. In return for your time and effort you will receive an honorarium of $10.

4. 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 (please fill out the section at the bottom of this form).

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 18-55.

_____ _____

Print your name here Your signature

_____

Date

If you wish to receive a summary of the results from this study when it is completed in the winter of 2005, please give us your permanent mailing address, complete with postal code:

_____

_____

Appendix 19: Time 2 Debriefing Form

Time 2 Debriefing

Thank you for participating in this study. We'd like to tell you more about this research project. We are conducting this study in an attempt to better understand the causes of Seasonal Affective Disorder. SAD is also known as the "winter blues" and is the kind of depression that comes on only during the fall/winter. By summer, the person feels better and is not depressed anymore. SAD is associated with what are referred to as atypical and typical symptoms. Typical symptoms include symptoms such as low mood, lack of pleasure in daily activities, guilt, and so on, and they are referred to as "typical" because they are typical of nonseasonal depression. SAD is also associated with a special cluster of "atypical" symptoms that include craving for high carbohydrate foods, weight gain, sleeping more than usual, and feelings of fatigue. Thus, SAD is associated with both typical and atypical symptoms.

Traditional causal models of SAD have tended to assume that the combination of decreased light during winter with some abnormal biological mechanism was sufficient to produce SAD. However, research shows that typical and atypical symptoms of SAD tend to appear at different times and respond differently to therapy. As traditional causal models suggested that the single combination of a biological vulnerability to decreased light was sufficient to account for both typical and atypical symptoms, they were unable to account for why typical and atypical symptoms are different from each other and commence at different times.

A recent causal model has been developed that hypothesizes that two vulnerabilities predispose SAD individuals to developing a depressive episode during the winter. In particular, the new model proposes that the combination of a biological vulnerability to decreased light may cause atypical symptoms, whereas cognitive vulnerabilities (i.e., the tendency to attribute one's feelings of depression to oneself and ruminating about the causes and consequences of one's depression) that are typically associated with nonseasonal depression may cause typical symptoms.

We were therefore interested in studying cognitive vulnerabilities in SAD. For a cognitive tendency to be a true vulnerability it must be detectable during remission, and not solely during the depressive episode. Therefore, we compared individuals who show depression only during fall/winter to those who do not show depression (comparison group) in their cognitive styles. In accordance with the new causal model of SAD, we predict that the SAD individuals will report higher levels of the cognitive styles that are associated with depression both during the fall/winter months and during the summer months when the SAD group does not experience depression. If our predictions are confirmed the results will suggest that cognitive styles are vulnerabilities to SAD.

We would like to ask a favour of you. We hope that you will not discuss what you know of this study openly with others. This is because we are still running the project, and we don't want people to know in full details exactly what we are investigating until they have completed the study themselves. Having such information ahead of time might influence the answers they give us.

We would sincerely like to thank you for participating in our study. Your cooperation has been most valuable to help us understand winter blues better. If you have any questions please ask the researcher at the present time or contact either Robert Dew or Dr. Tan at the phone number 343-3976 or by e-mail at sadstudy1@hotmail.com.