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# Attachment Dimensions and Depressive Symptoms: Mediating Effects of Social Support Seeking and Loneliness among First Year Undergraduate Students

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Attachment Dimensions and Depressive Symptoms: Mediating Effects of Social Support  
Seeking and Loneliness among First Year Undergraduate Students

by

Anna Arcuri, B.Sc. (Hons.)

A Thesis  
Submitted to the Faculty of Graduate Studies  
through the Department of Psychology  
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the Degree of Master of Arts at the  
University of Windsor

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2009

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16 September 2009

### **Author's Declaration of Originality**

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## Abstract

The objectives of the current study were to a) assess the mediating role of loneliness in the relationship between insecure adult attachment (i.e., attachment-related anxiety and attachment-related avoidance) and depressive symptoms and b) assess the mediating role of indirect social support seeking (e.g., complaining about a problem without requesting help) and avoidance of social support seeking (e.g., following through with tasks independently) in the relationship between insecure adult attachment and loneliness and subsequent depressive symptoms.

One hundred sixty-nine first-year undergraduate participants completed measures that assessed depressive symptoms, adult attachment, social support seeking, and loneliness. Structural Equation Modelling analyses showed that loneliness mediated the relationship between insecure adult attachment and depressive symptoms. Reluctance to seek support mediated the relationship between insecure adult attachment, loneliness, and subsequent depressive symptoms. These findings suggest that preventative and intervention programs for first-year students may use an attachment theory framework to guide treatment.

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## Introduction

### Overview of the Current Study

Beginning college is often the first major transition that adolescents undergo (Gall, Evans, Bellerose, 2000) and this experience can significantly impact students' mental health (e.g., Frazier & Schauben, 1994). Compared to same aged peers who are not attending college, students are more likely to experience maladjustment in the form of acute loneliness and isolation (Berman & Sperling, 1991), and depression (Radloff, 1991).

The estimated prevalence of depression in the general college population ranges from 14% to 17% (Fadloff, 1991; McDermott, Hawkins, Littlefield, & Murray, 1989; Rosenthal & Schreiner, 2000), and the rate tends to be higher among first year students, compared to those in upper years (Oliver & Burkham, 1979). Depression can interfere with students' ability to function socially, academically, and occupationally. Loneliness has also been found to reach its peak during adolescence and young adulthood (Perlman, 1988), and has been linked to increased vulnerability to a variety of psychosocial problems (Jones, Rose, & Russell, 1990). These include depression, anxiety, and interpersonal hostility (Hansson, Jones, Carpenter, & Remondet, 1986), alcohol consumption (Booth, 1983; Cacioppo, Hawkley, & Berntson, 2003), marijuana use (Page, Scanlan & Deringer, 1994), lower self-esteem and lower self-evaluation (Booth, 1983; Jones, 1982; Jones & Hebb, 1985; Peplau & Perlman, 1982; Ponzetti, 1990), and suicide (Booth, 1983; Cacioppo, Hawkley, & Berntson, 2003; Cutrona, 1982; Medora & Woodward, 1986). The potentially adverse consequences arising from loneliness and depression underline the importance of evaluating the mechanisms by which these conditions may develop in young adults.

Ainsworth and colleagues (Ainsworth, 1973; Ainsworth, Blehar, Waters, & Wall, 1978) have postulated that any event that is perceived as threatening (e.g., leaving home to begin university), will tend to activate the attachment system. Activation of the attachment system triggers cognitions related to attachment and encourages action tendencies related to seeking contact with an attachment figure. Only first-year students will be solicited for the current study because attachment related cognitions and support seeking behaviours may likely be most salient among first-year students who are emerging into adulthood. For securely attached individuals, threatening events most likely prompt comforting thoughts related to attachment figures and initiate active support-seeking. For insecurely attached individuals, threatening events are likely to evoke memories of unpleasant attachment experiences and fears about separation and rejection that interfere with effective support seeking (Mikulincer & Shaver, 2007).

The association between insecure adult attachment styles and depressive symptoms has been widely reported in the literature (e.g., Besser & Priel, 2003; Carnelley, Pietromonaco, & Jaffe, 1994; Mikulincer & Shaver, 2007; Roberts, Gotlib, & Kassel, 1996; Wei, Heppner, & Mallinckrodt, 2003; Wei, Mallinckrodt, Russell, & Abraham, 2004). In a recent study, Torquati and Raffaelli (2004) found that insecure individuals experience negative emotions more frequently and intensely than secure individuals.

A number of variables have been identified as mediators of the association between adult attachment and depressive symptoms. They include low self-esteem (Roberts et al., 1996); poor problem-solving, ineffective coping or perceived coping effectiveness (Lopez, Mauricio, Gormley, Simko, & Berger, 2001; Wei et al., 2003); self-splitting (e.g., good or bad) and self-concealment (Lopez, Mitchell, & Gormley, 2002); poor social self-efficacy and emotional awareness (Mallinckrodt & Wei, 2005); maladaptive perfectionism (Wei et al., 2004); poor affect regulation (Wei, Vogel, Ku, &



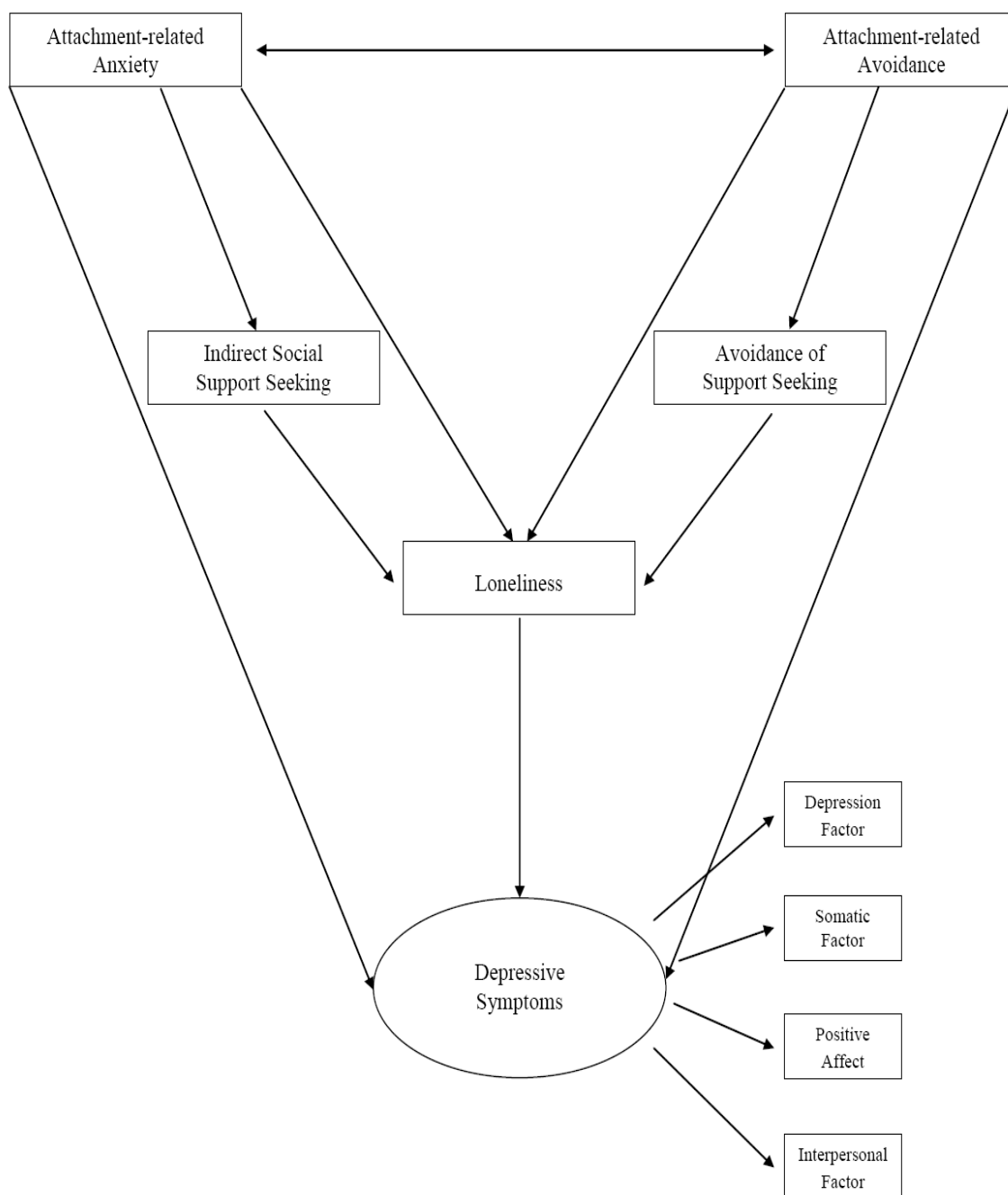
Zakalik, 2005); and social self-efficacy, self-disclosure, and loneliness (Wei, Russell, & Zakalik, 2005). However, the potential roles of social support seeking behaviour and loneliness in mediating the relationship between adult attachment and depression have not been extensively explored.

The purpose of the current study was to investigate hypothesized relationships between depression, attachment, social support seeking, and loneliness using Structural Equation Modeling (SEM). Better understanding of possible directional relationships among these variables could be useful in designing preventative and short-term intervention programs for students undergoing the transition to university. Such programs have the potential to decrease attrition rates among first-year students and increase the probability that their college or university experience will be successful and satisfying.

The original hypothesized model, which depicts the mediating factors for individuals high on attachment-related anxiety and high on attachment-related avoidance is shown in Figure 1. Specifically, attachment-related anxiety is hypothesized to contribute to an increased propensity to use indirect and ineffective social support seeking behaviours, which in turn, contributes to the experience of loneliness, and subsequent depressive symptoms. In contrast, attachment-related avoidance is hypothesized to contribute to the absence of social support seeking behaviours, which in turn, contributes to the experience of loneliness, and subsequent depressive symptoms.

In the literature review that follows, the constructs of interest in the current study (i.e., depression, attachment, social support seeking, and loneliness) are defined and theoretically relevant and empirically supported relationships between these major constructs are described. Finally, the specific hypotheses and models to be tested in the current study are presented.

Figure 1.

*Original Hypothesized Theoretical Model*

## Depression

The development of depressive symptoms during emerging adulthood has been explored by a number of researchers. Some investigators have reported that the average level of depressive symptoms remains unchanged during adolescence (e.g., Achenbach, Howell, McConaughy, & Stranger 1995; Garrison, Jackson, Marsteller, McKeown, & Addy, 1990), whereas others have reported changes in the level of depressive symptoms across the adolescent years. For example, Radloff (1991) reported that between ages 13 and 15, the experience of depressive symptomatology increases, reaching a peak at 17 to 18 years of age, and subsequently decreasing in adulthood. Similarly, Hankin, Abramson, Moffitt, Silva, McGee, and Angell (1998) found that self-reported depressive symptoms increased after 15 and stabilized after 18, and Blazer, Kessler, McGonagle, and Swartz (1994) found that 15 to 24 year old individuals reported the highest level of depressive symptoms. Overall, it appears that depressive levels are particularly elevated in late adolescence, the period during which students typically begin university.

Among emerging adults, depression has been related to a variety of psychosocial problems including interpersonal problems with friends, family, and partners (Joiner, Coyne, & Blalock, 1999); withdrawal from friends (Lewinsohn, Rohde, Seeley, Klein, & Gotlib, 2003); smaller, less connected social networks and fewer close relationships (Lewinsohn, Gotlib, & Seeley, 1997); and a poorer home atmosphere (Lewinsohn et al., 1999). Rohde, Lewinsohn, Tilson, and Seeley (1990) reported that depressed individuals have fewer and less effective coping behaviours and strategies compared to their non-depressed counterparts during the transition to adulthood. Young adults who are depressed also tend to perform more poorly in school (Gjerde, Block, & Block, 1988; Judd & Paulus, Wells, & Rapaport, 1996), experience occupational difficulties (Judd et al., 1996), and report greater dissatisfaction with their career

progress (Reinherz, Giaconia, Wasserman, Silverman, & Burton, 1999). Depression may also contribute to burnout, a cynical attitude toward study or work, and feelings of incompetence as a worker or student (Schaufeli, Martinez, Marques Pinto, Salanova & Bakker, 2002). Given the many negative consequences associated with depressive symptoms among emerging adults, it is important to investigate potential antecedents to depression, such as attachment style. It has been suggested that some psychological disorders, such as depression, are more prevalent among individuals with insecure attachment orientations (Mitchell & Dumas, 2004). Researchers have also reported that the negative cognitions and feelings common among insecurely attached individuals provide a fertile ground for the development of depression, particularly when these individuals face subsequent losses, trauma, or difficulties (Abramson, Metalsky, & Alloy, 1989; Beck, 1976; Bowlby, 1980).

*Models of depression.* Various treatment models of depression, such as emotion-focused therapy (EFT), interpersonal therapy (IPT), and cognitive behavioural therapy (CBT) have been developed and have shown their effectiveness in the treatment of depression. Several approaches to the treatment of depression demonstrate the importance of individuals' attachment orientations and interpersonal styles and their relationship to the experience of depression. In fact, attachment theory has guided the treatment modalities of EFT and IPT in particular. EFT evaluates how individuals deal with emotions, how they engage with others, and how they perceive themselves based on their interactions with attachment figures (Johnson, 2009). The theory of EFT purports that negative behaviour, among partners for instance, occurs when their need for a secure attachment is not fulfilled (James, 2005). Greenberg and Watson (1998) found that although EFT was equally as effective as the CBT on treating depression (based on the Beck Depression Inventory), EFT appears to be more effective in improving interpersonal functioning. Like EFT, interpersonal therapy (IPT) also

incorporates attachment theory and childhood experiences in understanding the development of interpersonal styles and guiding treatment. Research supports that IPT is effective as a treatment for depression and other psychiatric disorders (Lipsitz et al., 2008). Therefore, in regards to the treatment of depression using an EFT or IFT modality, importance is placed on understanding clients' life histories and early experiences with attachment (Greenberg & Watson, 2006).

### Attachment

Attachment theory was initially introduced by Bowlby (1980) to explain the emotional bond between infants and their caregivers. According to attachment theory, early experiences with caregivers lead to the development of internalized working models, which are conceptualizations that shape and regulate how individuals view themselves and others, and the extent to which they are trusting or apprehensive in relationships (Bretherton, 1990).

Individuals with emotionally available caregivers tend to form internal working models in which the self is experienced as worthy, others are experienced as trusting, and relationships are experienced as valuable. In contrast, individuals with insensitive caregivers tend to form negative and pessimistic working models of the self, others, and relationships (Bowlby, 1980).

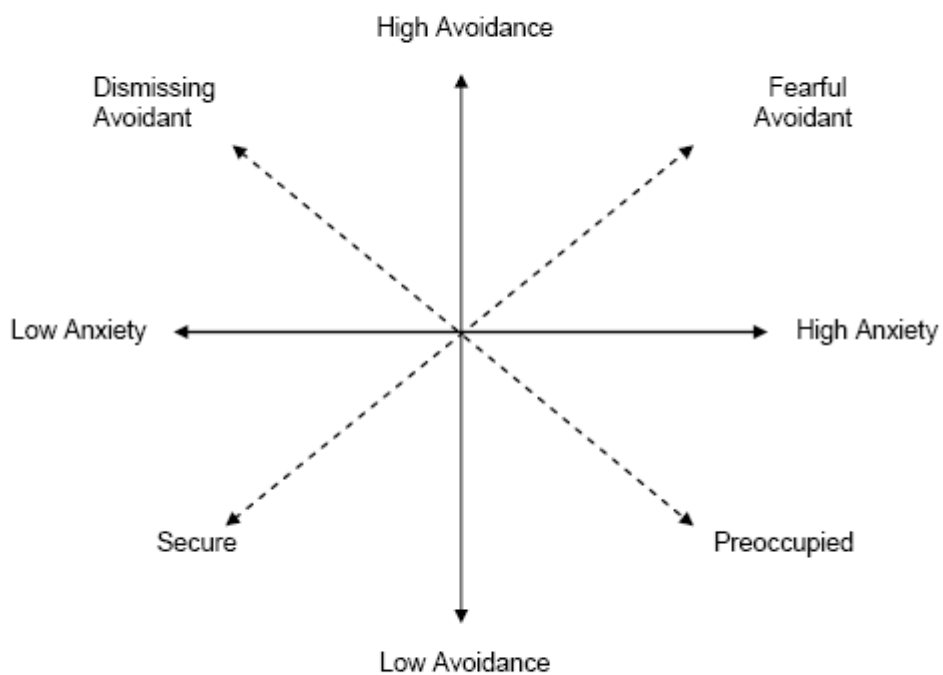
*Attachment and depression.* Bowlby (1973, 1980) suggests that the loss of a secure attachment figure during infancy, childhood, or adolescence, either because of the death of a caregiver or the persistent lack of a secure relationship with a caregiver, plays an important part in the development of later depression (Bowlby, 1980). The relationship between insecure attachment and depression is well supported in the literature. For instance, Harris, Brown, and Bifulco (1990) found that witnessing a parent's death or undergoing long-lasting separations from a parent in early childhood

increased the likelihood that depression would develop in adulthood. Bowlby's ideas have also been supported by longitudinal studies that show that attachment-related anxiety and attachment-related avoidance predict depressive symptoms (Hankin, Kassel, & Abela, 2005; Whiffen, 2005). In particular, although attachment insecurity has been found to predict variations in depression over time (Haaga et al., 2002), experimental manipulations of elated or depressed mood have not been found to affect reports of subsequent attachment insecurity (Haaga et al., 2002; Roisman, Fortuna, & Holland, 2006). These findings suggest that attachment insecurities predict the development of depression, but depression does not impact people's perception of parental availability and parental responsiveness. Therefore, individuals are more vulnerable to experiencing depressive symptoms if they are not securely attached.

*Conceptualizations of insecure attachment.* Fraley and Waller (1998) have proposed that insecure adult attachment should be theoretically conceptualized as two continuous dimensions; *anxiety* (attachment-related anxiety) and *avoidance* (attachment-related avoidance); see Figure 2. Individuals with low levels on both attachment-related anxiety and attachment-related avoidance demonstrate a secure adult attachment orientation (Brennan, Clark, & Shaver, 1998; Lopez & Brennan, 2000; Mallinckrodt, 2000), characterized by a "chronic sense of attachment security, trust in partners and expectations of partner availability and responsiveness, comfort with closeness and interdependence, and ability to cope with threats and stressors in constructive ways" (Mikulincer & Shaver, 2007; p. 27). For secure individuals, past experiences with responsive attachment figures increases their faith in proximity seeking as an emotion regulation coping strategy, especially under stressful situations. Fraley and Waller (1998) assert that individuals high on attachment-related *anxiety* have a strong yearning for closeness and protection, but are sensitive to rejection, and worry about the security of relationships and their value to others. Such individuals use

Figure 2.

Insecure Attachment demonstrated as Two Dimensions



Note: Diagram of the two-dimensional space defined by attachment anxiety and avoidance, showing the quadrant names suggested by Bartholomew (1990).

hyperactivating strategies to cope with insecurity and distress (Main, 1990). The objective of hyperactivating strategies is to get an attachment figure, who is perceived as unreliable and inadequately responsive, to be more attentive and to provide protection and support (Cassidy & Kobak, 1988; Main, 1990). According to Mikulincer and Shaver (2007), hyperactivating strategies include being cautious of potential threats, catastrophizing or exaggerating appraisals of threats, and ruminating about previous or future threatening experiences. These cognitions reactivate proximity seeking efforts, overdependence, and emphasize the importance of gaining attention, care, and support. Mikulincer and Shaver (2007) further suggest that the attachment system of individuals that endorse high levels of attachment-related anxiety is frequently activated, even at times when objective threats do not exist.

In contrast, Fraley and Waller (1998) maintain that individuals with attachment-related *avoidance* experience discomfort with closeness or dependency on others. Such individuals prefer emotional distance, are compulsively self-reliant, and use deactivating strategies to cope with insecurity and distress (Main, 1990). According to Mikulincer and Shaver (2007), the objective of deactivating strategies is to find a mode to get personal needs met while maintaining distance, control, and autonomy. In using such strategies, individuals deny their need for comfort or protection and avoid negative emotional states that might ignite the attachment-system. Deactivating strategies include avoiding intimacy or interdependence and ignoring potential threats (Mikulincer & Shaver, 2007).

*Attachment and gender.* In light of the fact that attachment styles are established as a result of early experiences with an attachment figure, attachment styles should be independent of sex. Warber (2007) found support for this prediction. However, Silverman (1987) asserts that gender socialization could impact the distribution of sexes across attachment styles. Although Hazan and Shaver (1987) did not find significant sex differences in the prevalence of secure, avoidant, and anxious styles, sex differences



were found when using Bartholomew and Horowitz' (1991) four-category attachment style measure (secure, preoccupied, dismissing and fearful). Similarly, a number of researchers have reported that attachment anxiety is associated with lower scores on measures of masculinity, whereas attachment avoidance is associated with lower scores on femininity (e.g. Alonso-Arbiol, Shaver, & Yarnoz, 2002; Collins & Read, 1990; Shaver, Papalia, et al., 1996). Based on these findings, it seems valuable to evaluate sex differences in attachment style.

The behavioural strategies used by individuals high on attachment-related anxiety and high on attachment-related avoidance also impact their search for social support. Particularly, Hazen and Shaver (1987) indicate that attachment history creates expectations about the availability that significant others can provide and Lakey and Heller (1988) reported that the feeling of social support is associated with personality characteristics such as attachment style.

### Social Support Seeking

Cutrona (1996) describes social support as the “responsiveness to another’s needs and more specifically as acts that communicate caring; that validate the other’s worth, feelings or actions’ or that facilitate adaptive coping with problems through the provision of information, assistance, or tangible resources” (p. 10). Interestingly, this definition of social support reflects conditions that are believed to provide a fertile ground for the development of a secure attachment. This description of social support was used in the current study because it appears that individuals who successfully secure social support, as described by Cutrona, are likely to undergo a less alienating experience during the transition into college or university.

Also relevant to social support is the need to differentiate between seeking instrumental social support and seeking emotional social support. The former relates to

seeking advice, assistance, or information, whereas the latter relates to seeking moral support, sympathy, or understanding (Aldwin & Revenson, 1987). When individuals seek social support, either instrumental or emotional, the underlying goal is to satisfy personal needs. However, the behavioural approaches that individuals utilize in proximity and support seeking can be influenced by attachment patterns (Mikulincer & Florian, 1998; Shaver & Clark, 1994).

*Social support seeking and attachment.* According to attachment theory, support seeking is the principle strategy of the attachment system (Mikulincer & Shaver, 2007). Individuals with different attachment orientations employ different strategies to seek out and to provide support, and they demonstrate different communication abilities (Bradford, Feeney & Campbell, 2002; Feeney & Collins, 2001; Mikulincer & Nachson, 1991; Weger & Polcar, 2002). Thus, it appears that attachment style predicts support seeking and support giving behaviour (Collins & Feeney, 2000; Feeney, 1996; Kuncze & Shaver, 1994, Weger & Polcar, 2002). Further, support seeking behaviours result from recurring patterns of interaction. Individuals develop habitual methods of communication to acquire social support. Different methods of communication across attachment style categories may explain why some people are repeatedly unsuccessful in getting others to respond to their requests for social support, and why they fail to benefit from support or feel supported when support is provided (Sachdev, 2007). For insecurely attached individuals in particular, unpleasant attachment memories associated with past proximity seeking may hinder subsequent support seeking efforts. Therefore, it appears plausible that individuals who are unsuccessful in their support seeking attempts are likely individuals with insecure attachment orientations.

*Social support seeking, attachment-related avoidance, and attachment-related anxiety.* Individuals who are high on attachment-related avoidance consistently demonstrate weak inclinations to seek support. In one study in which appraisals of

relationship threats were controlled, attachment-related avoidance was inversely associated with social support seeking (Radecki-Bush, Farrell, & Bush, 1993). Similarly, when holding physical symptoms constant, Feeney and Ryan (1994) found a direct link between avoidant tendencies and unwillingness to seek help from health professionals. In another study, cancer patients with avoidant attachments were found to avoid support seeking as a means of coping with distress (Kotler, Buzwell, Romeo, & Bowland, 1994). Marques (2006) investigated the coping strategies of late adolescents (ages 18 to 24 years) and found that individuals with a dismissing attachment style (high avoidance, low anxiety) were inclined to use distancing (i.e., a cognitive effort to detach themselves from the situation). In a study by Lopez et al. (1998), among individuals undergoing serious problems, those with avoidant attachment styles were less likely to seek counselling than those with anxious attachment styles. Similarly, Vogel and Wei (2005) reported that individuals with attachment-related avoidance denied their distress and were hesitant to seek help.

In an experimental study, Hart, Shaver, and Goldenberg (2005) had American undergraduates read a hostile or neutral essay about America in one study, and in a second study, he exposed undergraduates to either no feedback or failure feedback following a self-esteem related cognitive task. Subsequent to these manipulations, participants in both studies were asked to imagine their ideal romantic partner and rate the degree to which they would be able to depend on their partner for sympathy and support. Avoidant individuals reported the least desire for closeness compared to individuals with all other attachment styles. In summary, there is clear evidence in the literature that individuals high on attachment-related avoidance are reluctant to seek social support or turn to others when they are distressed.

Differences exist between the support seeking approaches of individuals with avoidant tendencies and those with anxious ones. For example, in observational

studies, avoidant romantic or marital partners separating at an airport (Fraley & Shaver, 1998) and avoidant serious dating partners discussing a personal problem (Collins & Feeney, 2000) were found to seek support or proximity less frequently than anxious individuals.

However, studies that have investigated the relationship between anxious attachment and social support seeking behaviour have been less consistent than those that have evaluated the relationship between avoidant attachment and social support seeking. In some studies, researchers have found that attachment-related anxiety correlates with reduced social support seeking (e.g., Feeney, 1998; Larose & Bernier, 2001), whereas other researchers have failed to find a significant relationship (e.g., Howard & Medway, 2004).

Mikulincer and Shaver (2007) suggest that the inconsistent findings may be the result of the ambivalence around seeking support that is experienced by anxiously attached individuals. In particular, although anxious individuals have a strong desire for security, they also doubt the availability of support. For instance, Larose et al. (2001) found that students who reported high levels of anxiety were less likely to display positive support seeking behaviours during a 10-session counseling program compared to secure students.

Interestingly, Vogel and Wei (2005) found two different pathways by which attachment-related anxiety impacted social support seeking. In one pathway, attachment-related anxiety was linked to greater psychological distress and increased support seeking. In the other pathway, attachment-related anxiety was associated with negative perceptions of others' supportiveness, which led to reduced support seeking. The inconsistent findings related to anxious attachment and seeking social support may actually reflect anxious individuals' tendency to seek support in an *indirect* way.

In one study in which researchers assessed proximity and support seeking behaviour, attachment-related anxiety was not linked to indirect support-seeking strategies (Collins & Feeney, 2000). However, in another study, anxiously attached individuals were less likely to report direct support seeking (Collins & Feeney, 1998). Rather, anxiously attached individuals preferred indirect methods (i.e., through nonverbal distress signals, such as sulking or sighing) to communicate a need for help. In addition, Barbee, Rowatt, and Cunningham (1998) report that individuals who report reluctance or ambivalence about seeking support tend to communicate ambiguous requests or signals for help. Consequently, the response they receive and the support offered may not be in line with the type of support required or may not be as useful as the support seeker had hoped (Sachdev, 2007).

Overall, studies that have investigated the relationship between attachment insecurity and support-seeking behaviour report that avoidant attachment prevents effective support seeking, whereas anxious attachment impedes effective support-seeking behaviour. Some studies suggest that for anxious individuals, the preoccupation with rejection and abandonment appears to muddle support seeking attempts and increase their propensity to communicate nonverbal and indirect expressions of helplessness and distress when seeking support (Mikulincer & Shaver, 2007). However, the contradictory findings in the literature suggest that further research is necessary to accurately understand the relationship between attachment-related anxiety and support seeking behaviour.

*Social support seeking and culture.* Mortenson (2009) compared the social skills of Chinese and European Americans when they seek support and he reported that the association between social skills, interpersonal trust, appropriateness of asking for help, and fully displaying emotional distress to friends were not influenced by differences in culture. Mortenson (2006) also found that students from both Chinese and European

nations viewed support seeking as more appropriate compared to coping alone. However, some researchers have reported that in East Asian cultures, such as China and Japan, cultural norms deter people from expressing emotional distress to family and friends for concern of disturbing relational harmony (Lee, 1996; Matsumoto, 1996; Taylor et al., 2004). These cultural factors may exacerbate the perceived risks, such as loss of face because of embarrassing feelings (Barbee & Cunningham, 1995), which are associated with seeking support. Similarly, Matsumoto (1996) found that in many East Asian cultures, emotional crises are commonly associated with a loss of face and feelings of shame than with feelings of frustration or anger. Such feelings often lead to social withdrawal, rather than prompting support seeking behaviours (Frijda, Kuipers, & ter Schure, 1989). Nevertheless, Feng and Burleson (2008) indicate that although cultural differences in support seeking exist, these differences are small in magnitude. Based on these findings, it may be useful to evaluate potential racial/ethnic differences in support seeking strategies.

### Loneliness

Perlman and Peplau (1981) defined loneliness as “the unpleasant experience that occurs when a person’s network of social relationships is deficient in some important way, either quantitatively or qualitatively” (p.31). Loneliness has also been defined according to various theoretical perspectives. Two theories of loneliness – Cognitive Processes Theory and Social Needs Theory (Booth, 1983; Peplau & Perlman, 1982b; Terrell-Deutsch, 1999) are most often cited in the literature. According to Cognitive Processes Theory, loneliness reflects dissatisfaction with *perceived* social relations, rather than actual unmet social needs (Terrell-Deutsch, 1999).

In contrast, Social Needs Theory emphasizes the affective aspects of social relations (Terrell-Deutsch, 1999). This perspective, which evolved from psychoanalytic

theory, suggests that individuals are born with innate social needs for contact and interpersonal relationships and when these needs are not fulfilled, loneliness develops (Terrell-Deutsch, 1999). Within the social needs perspective, Weiss (1973) has differentiated between loneliness that occurs due to emotional isolation (emotional loneliness) and loneliness that reflects social isolation (social loneliness). Emotional loneliness is characterized by the absence of close emotional attachments in which individuals feel connected, accepted, and understood, whereas social loneliness is characterized by the absence of an engaging social network.

A number of investigators have reported findings that support Weiss' distinction between emotional and social loneliness (e.g., Brackin, 2002; Hsu, Hailey, & Range, 1987). For example, Russell, Cutrona, Rose, and Yurko (1984) and Vaux (1988) investigated differences in the experience of social and emotional loneliness among college students and found support for this distinction. De Jong Gierveld (1987) also concluded that loneliness occurs because of a lack of quality relationships which include "situations in which the number of existing relationships was smaller than is considered desirable or admissible, as well as situations where the intimacy one wishes for has not been realized" (p.120).

Weiss (1984) defines loneliness as an anxiety provoking situation that comes about when an individual is separated from their attachment figure, and their needs for proximity, love, and security are unmet. In the present study, loneliness was construed as the experience of unmet social needs, which may result from indirect (and ineffective) social support seeking strategies or the reluctance to seek support at all. Both unidimensional and multidimensional measures of loneliness were utilized in the current study in order to gain a better understanding about the various facets (i.e., emotional and social) of loneliness.

*Loneliness and depression.* Some researchers have found that adolescents experience the highest rate of loneliness of any age group, with an estimated 8 to 16% of adolescents reporting being very lonely (Page et al., 1994; Ponzetti & Cate, 1988). Life changes that occur during the transition to college, particularly the potential changes in social networks (Buchholz & Catton, 1999; Larson, Moneta, Richards, & Wilson, 2002; Ponzetti & Cate, 1988), may significantly impact the loneliness experiences of emerging adults. Not surprisingly, the experience of loneliness is particularly pronounced among first year students. Moreover, loneliness has consistently been found to correlate with depression (Atta, 1993; Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006; Ouellet & Joshi, 1986; Wiseman, Gutfreund, & Lurie, 1995), and there is evidence that the experience of loneliness makes people more vulnerable to developing depression (Rich & Scovel, 1987). For example, Martin (1997) found loneliness to be a precursor to depression in a sample of adolescent suicide attempters. Oksoo (2001) also found that loneliness was the principal predictor of depression for both men and women in their sample of Korean college students.

*Loneliness and attachment.* Weiss (1974) addressed the association between attachment theory and loneliness. A history of rejecting, inconsistent, or unavailable attachment figures seems to contribute to the experience of chronic loneliness (e.g. Rubenstein & Shaver, 1982; Weiss, 1974). In their review of the literature, Mikulincer and Shaver (2007) noted that an inverse relationship between loneliness and secure attachment with parents or peers has been consistently reported by researchers in the area. For example, DiTommaso (1998) investigated attachment and loneliness among female partners of members of the Canadian Forces; they found that as the degree of attachment security increased, the likelihood of experiencing chronic loneliness decreased.



Other investigators have also found support for the inverse relationship between attachment security and loneliness in Chinese samples. For example, Man and Hamid (1998) assessed categorical attachment styles and reported that among Chinese trainee teachers, those with a fearful attachment style (high anxiety; high avoidance) self-reported the highest degree of loneliness, followed by preoccupied individuals (high anxiety; low avoidance), dismissing individuals (low anxiety; high avoidance), and securely attached trainee teachers. Similarly, securely attached Turkish students were also found to report lower levels of loneliness compared to insecurely attached students (Deniz, Hamarta, & Ari, 2005). These findings may suggest that the relationship between loneliness and attachment applies across cultures, and not simply among Caucasian samples.

In the majority of studies that have compared individuals with anxious attachment styles to individuals with secure attachment styles, anxious attachment has been found to be associated with loneliness. Similar findings have been reported in studies that have compared individuals with avoidant attachment styles to those with secure attachment styles. Reports linking avoidant styles to loneliness also suggest that avoidant individuals may not use deactivating strategies (i.e., deny their need for comfort or protection) to the point that they fail to report concern about their lack of supportive relationships (Mikulincer & Shaver, 2007).

Some researchers have theorized that anxious attachment styles contribute to loneliness more than avoidant ones (e.g., Berlin, Cassidy, & Belsky, 1995) since anxious individuals tend to amplify their unfulfilled needs for love and security, whereas avoidant individuals attempt to restrict their attachment needs (Mikulincer & Shaver, 2007). In studies where attachment has been categorically defined, individuals with anxious attachment styles report greater loneliness compared to individuals with avoidant attachment styles (Man & Hamid, 1998; Marsa et al., 2004). However, these results are

not consistent across studies; other researchers have not found a significant difference between anxious and avoidant individuals (Goosens, Marcoen, van Hees, & van de Woestijne, 1998).

In studies where insecure attachment has been operationalized as two continuous variables, researchers have found positive associations between attachment-related anxiety and loneliness, and between attachment-related avoidance and loneliness (e.g. Gillath et al., 2005; Wei, Russell, & Zakalik, 2005; Wei, Shaffer, Young, & Zakalik, 2005). In conjunction with the different social support seeking behaviours observed among anxious and avoidant individuals, it appears that although both groups of people are inclined to experience loneliness, only those with avoidant attachments withdraw socially (Larose & Bernier, 2001).

*Loneliness and social support seeking.* The tendency for individuals with insecure attachment styles to avoid seeking support or to seek help in ineffective ways has implications for how they perceive others' supportiveness. In most studies, anxious and avoidant adults report having less available support and being less content with the support they receive (e.g., Anders & Tucker, 2000; Mallinckrodt & Wei, 2005; Vogel & Wei, 2005).

Variables reflecting lower levels of social support have been consistently associated with increases in loneliness during the transition into university or college (Nicpon et al., 2006). In fact, for first-year college students, the leading cause of loneliness is the lack of a satisfactory social network (Damsteegt, 1992). It is plausible that the support seeking behaviours of students with unsatisfactory social networks differ from the support seeking strategies employed by students with satisfactory social networks. It would be useful to investigate the support seeking behavioural tendencies of first-year university students and its association with the experience of loneliness.

Riggio, Watring, and Throckmorton (1993) found that social skills, in combination with supportive social networks, helped with college student adjustment, including lessening the perceptions of loneliness. The measure of social skills was composed of a total score of three communication ability dimensions: expressivity, sensitivity, and control. Each communication dimension occurs in two different domains, nonverbal and verbal. In another study involving participants from two cultural groups (one group was Polynesian, Melanesian, and Micronesian and the other was East Indian and Caucasian), participants who perceived less social support reported increased loneliness (Ginter, Glauser, & Richmond, 1994).

The relationship between social support and loneliness has also been assessed in some prospective studies. Riley (1995) found that social support factors predicted both chronic and state loneliness in their sample of female undergraduates and Jackson, Soderline, and Weiss (2000) found that lower levels of social support predicted increases in loneliness six weeks later in an unselected group of college students. Likewise, Jones and Moore (1987) reported that several aspects of social support (e.g., satisfaction, network size, density, and reciprocity) were related to loneliness among students in their first week of college and in the eighth week of classes. Regardless of the number of people in an individual's social network, receiving support from others reduces the experience of loneliness (Stokes, 1985). Overall, it appears that individuals who fail to seek support, or who are unsuccessful in their support seeking strategies, are less likely to receive the support they need, and in turn, more likely to experience loneliness.

#### Mediating Models and Methodological Issues

Few researchers have investigated potential mediators that might account for the relation between attachment insecurity and loneliness. However, DiTommaso, Brannen-

McNulty, Ross, and Burgess (2003) report that social skills appear to serve as a mediator in the relationship between secure and fearful attachments (high anxiety; high avoidance) and social loneliness. Larose and Bernier (2001) found that for students undergoing the transition into college, the direct relationship between preoccupied attachment (high anxiety; low avoidance) and loneliness was accounted for by help-seeking.

Wei, Russell and Zakalik (2005) investigated adult attachment, social self-efficacy, self-disclosure, loneliness, and subsequent depression among first year college students and found that whereas attachment-related anxiety contributed to loneliness and subsequent depression through social self-efficacy, attachment-related avoidance contributed to loneliness and subsequent depression through avoidance of self-disclosure. Other investigators have explored the experience of loneliness as a mediator between social competence and depression. In one study of children, loneliness served as the mediator between social withdrawal or peer rejection and later depressed mood (Boivin, Hymel, & Burkowski, 1995).

Although some researchers have begun to investigate the mediated effects of social support on the relationship between adult attachment and loneliness, most of these studies have based their investigations on attachment categories. However, based on Brennan, Clark, and Shaver's (1998) findings that anxiety- and avoidance-related attachment are two common factors in most categorical self-report attachment measures, investigators now tend to operationalize and measure attachment dimensionally, not categorically. It is beneficial to measure adult attachment dimensionally in order to gain a better understanding about the differences in seeking support, and the experience of loneliness and depression among people who score high and low on a particular attachment orientation (e.g., high on attachment-related anxiety versus low on attachment-related anxiety). In the current study, insecure adult

attachment is conceptualized as two continuous dimensions: attachment-related anxiety and attachment-related avoidance.

Research to date has not examined social support seeking behaviours as a mediating variable in the relationship between insecure adult attachment, loneliness, and subsequent depressive symptoms. However, this was carried out in the current study. In addition, whereas the vast majority of studies have used a unidimensional measure of loneliness, a multidimensional measure of loneliness was employed in the current study to gain an exploratory understanding about the various facets of loneliness and their associations with depression and attachment dimensions.

Finally, the current study employed a more comprehensive model to try to account for the direct relationship between insecure attachment (i.e., attachment anxiety and attachment avoidance) and depressive symptoms. Identification of distinct mechanisms that account for the depressive symptoms experienced by anxious and avoidant students could suggest specific interventions to help students with the transition into university.

#### Rationale for the Hypothesized Model

The preceding review suggests that first-year undergraduate students are vulnerable to the experience of loneliness and subsequent depression. The different support seeking behavioural tendencies that are common among insecurely attached individuals suggest that those high on attachment-related anxiety are inclined to use indirect strategies in their efforts to seek social support, whereas individuals high on attachment-related avoidance are reluctant to seek social support when distressed. These behavioural tendencies increase the likelihood that proximity and social needs are unfulfilled, which in turn, may contribute to the experience of loneliness and subsequent depressive symptoms.

As shown in Figure 1 (see page 4), two different paths are hypothesized to examine the distinct mediating effects for individuals with high levels of attachment-related anxiety and high levels of attachment-related avoidance. Specifically, attachment-related anxiety is hypothesized to contribute to an increased propensity to use indirect social support seeking behaviours, which in turn, contributes to the experience of loneliness, and subsequent depressive symptoms. Attachment-related avoidance is hypothesized to contribute to the absence of social support seeking behaviours, which in turn, contributes to the experience of loneliness and subsequent depressive symptoms.

### Hypotheses

*Hypothesized relationships between pairs of variables.*

1. Attachment-related anxiety and attachment-related avoidance will both be positively associated with depressive symptoms.
2. Attachment-related anxiety and attachment-related avoidance will both be positively associated with loneliness.
3. Attachment-related anxiety will be positively associated with indirect and ineffective social support seeking behaviours.
4. Attachment-related avoidance will be positively associated with avoidant support seeking behaviours.
5. Indirect social support seeking behaviours and avoidant social support seeking behaviours will be positively associated with loneliness.
6. Loneliness will be positively associated with depressive symptoms.

*Hypothesized multivariate models.*

- 7a. Loneliness will mediate the relationship between attachment-related anxiety and depressive symptoms.

7b. Loneliness will mediate the relationship between attachment-related avoidance and depressive symptoms.

8a. Indirect social support seeking behaviours (and not reluctance to seek support) will mediate the relationship between attachment-related anxiety and loneliness and subsequent depressive symptoms.

8b. Reluctance to seek social support (and not indirect support seeking behaviours) will mediate the relationship between attachment-related avoidance and loneliness and subsequent depressive symptoms.

## Method

### Participants

*Participant characteristics.* Altogether, 212 first-year undergraduate students participated in the current study. However, 43 participants were 21 years of age or older and were excluded because they fell outside the typical age of first-year students that was the focus of the current study. The final sample included 169 students (127 females, 42 males) who were in their first term of university at the University of Windsor. Their mean age was 18.15 years ( $SD = .69$  years; range = 17 to 20 years); 58.6% ( $N=99$ ) were single and 41.4% ( $N=70$ ) reported being in a dating relationship.

With respect to the racial/ethnic breakdown in the sample, 73.4% ( $N=124$ ) identified as Caucasian, 4.7% ( $N=8$ ) as African Canadian, 3.0% ( $N=5$ ) as Asian Canadian, 1.8% ( $N=3$ ) as Latin American, 1.2% ( $N=2$ ) as West Asian (e.g., Iranian, Afghanistan), 1.2% ( $N=2$ ) as Filipino, 3.6% ( $N=6$ ) as Mixed, and 10.7% ( $N=18$ ) as Other. The majority of participants ( $N=119$ , 70.4%) reported living at home (i.e., with parents and family); the other 29.6%, ( $N=50$ ) reported living away from home. Of the participants who were living away from home, 84.3% ( $N=43$ ) reported that it was their first experience away. The mean duration of living away from their hometown was 3.01 months ( $SD = 2.31$ , range = 1 to 12 months), an average that roughly corresponds to the beginning of the fall term. Most participants were still living in their hometown (63.9%;  $N=108$ ).

More than half the sample (58.0%,  $N=98$ ) reported that they were living with both natural parents, 18.3% ( $N=31$ ) were living with a roommate, 7.1% ( $N=12$ ) lived with their blended family (e.g., with a step-parent); 5.3% ( $N=9$ ) lived with their mother only, 4.1% ( $N=7$ ) lived alone, 1.8% ( $N=3$ ) lived with a romantic partner, and 1.2% ( $N=2$ ) lived



with their father only. Another 3.0% (N=5) described their living arrangements as “other”, and two participants did not report their living arrangements.

*Participant recruitment.* Participants were recruited through the Psychology Department Participant Pool at the University of Windsor. Undergraduate students who register for the pool at the beginning of the term are permitted to earn course credits through research participation and may apply earned credits to their final grades in participating psychology courses. Participants self-register for the pool using an online web-based system. As part of the registration process, they provide demographic and contact information and respond to screening questions. They can then access descriptions of studies for which they meet the inclusion criteria and sign up for specific testing sessions.

The current research was presented to potential participants as a study intended to assess “behavioural tendencies that relate to successful transitions to university among first year students” (see Participant Pool Description, Appendix A). Students were eligible to participate if they were currently beginning their first year of university.

In order to ensure participation by adequate numbers of participants with anxious and avoidant attachment styles, an additional recruitment procedure was employed. Two screening questions, based on Hazen and Shaver’s (1987) items reflecting avoidant and anxious interpersonal styles were included in the registration questionnaire completed by students signing up for the participant pool (See Appendix B). The two questions were: 1. “I am somewhat uncomfortable being close to others; I find it difficult to trust them completely, difficult to allow myself to depend on them”, and 2. “I find that others are reluctant to get as close as I would like”.

A random selection of individuals who responded “yes” to one or both of these questions were contacted directly via email and invited to participate in the study (See Appendix C). Of the 59 individuals who were contacted by email, 25 (42.4%)

participated in the study. They included 16 of 23 people who had responded “yes” to the anxious attachment screening question, six of ten people who had responded “yes” to the avoidant attachment screening question, and three of 26 people who had responded “yes” to both the anxious and the avoidant screening questions.

### Procedure

The proposed study was reviewed and approved by the Research Ethics Board at the University of Windsor. Participants for the current study were recruited during a four-week period that began four weeks into the fall term. Participants were assigned a unique research identification number, provided written informed consent (see Consent Form and Letter of Information, Appendix D and Appendix E, respectively) and were treated in accordance with ethical standards for research with human subjects according to criteria described by Sales and Folkman (2000). They completed the questionnaire package (described below) in groups of five to 20 participants during pre-arranged testing sessions that were supervised by the researcher. Measures within the questionnaire package were presented in counter-balanced order to control for order effects.

### Measures

*Demographic questionnaire.* Participants responded to questions about their age, sex, ethnicity, year of study, relationship/marital status, and living arrangements (see Appendix F).

*Depressive symptoms.* The Centre for Epidemiologic Studies–Depression Scale (CES-D; Radloff, 1977) is a 20-item self-report scale that assesses current levels of depressive symptoms in the general population (Radloff, 1977). It is a psychometrically sound measure with wide applicability and is appropriate for use in culturally diverse samples (Beiser, Woodbury, & Cargo, 1994). Respondents are asked to rate the

frequency of symptoms experienced during the previous week on a 4-point Likert scale that ranges from 0 (rarely or none of the time [less than 1 day]) to 3 (most or all of the time [5-7 days]). Scores range between 0 and 60, with higher scores indicating higher levels of depressive mood and symptoms. Convergent validity is supported by the positive correlation ( $r = .86$ ) between the CES-D and the Beck Depression Inventory (Santor, Zuroff, Ramsay, Cervantes, & Palacios, 1995). In the present study, the coefficient alpha was .91 (see Table 1). Although some investigators have evaluated the test-retest reliabilities of the CES-D, such analyses are not particularly relevant since this measure was designed to assess current levels of depressive symptomatology. Radloff (1977) found support for four factors which were easily interpretable as Depressed Affect (7 items), Positive Affect (4 items), Somatic and Retarded Activity (7 items), and Interpersonal (2 items). In the current study, coefficient alphas for these factors were .87 for Depressed Affect, .80 for Positive Affect, .69 for Somatic and Retarded Activity, and .57 for the Interpersonal factor (See Table 1).

*Adult attachment.* The Experiences in Close Relationships Scale (ECR; Brennan, Clark, & Shaver, 1998), a 36-item self-report measure of adult attachment, was used to assess attachment dimensions. In their factor analysis of responses from more than 900 university students, Brennan et al. (1998) found that two major higher-order factors (anxiety and avoidance) were common to most published self-report attachment measures.

On the ECR, respondents rate their agreement with various statements reflecting anxiety and avoidance on a 7-point Likert scale ranging from 1 (disagree strongly) to 7 (agree strongly). The subscale that evaluates attachment-related anxiety is composed of 18 items and assesses fear of rejection and preoccupation with abandonment (e.g., "I worry about being rejected or abandoned;" "I need a lot of reassurance that close

Table 1.

*Internal consistency coefficients for measures used in the current study: Cronbach's alpha (N = 169)*

Variable	Alpha
ECR Attachment-related Anxiety Subscale	.88
ECR Attachment-related Avoidance Subscale	.89
CES – D Total Score	.91
CES – D Depression Factor	.87
CES – D Somatic Factor	.69
CES – D Positive Affect Factor	.80
CES – D Interpersonal Factor	.57
UCLA – Loneliness Scale Total Score	.92
SELSA Social Loneliness Subscale	.87
SELSA Romantic Emotional Loneliness Subscale	.83
SELSA Family Emotional Loneliness Subscale	.90
SAQ Avoidance Subscale	.82
SAQ Seeking Social Support Subscale	.74
COPE Instrumental Support Subscale	.72
COPE Emotional Support Subscale	.84
COPE Venting Emotion Subscale	.73
Indirect Social Support Seeking Total Score	.77

relationship partners really care about me”). The subscale that evaluates attachment-related avoidance also consists of 18 items and assesses discomfort with getting close or being dependent on others, self-reliance, and emotional suppression (e.g., “I find it difficult to allow myself to depend on close relationship partners;” “I try to avoid getting too close to others;” “I don’t mind asking close others for comfort, advice, or help” [reversed-scored]). Scores on both subscales can range from 18 to 126; higher scores indicate greater attachment anxiety or greater attachment avoidance. Coefficient alphas of .91 for the Anxiety subscale and .94 for the Avoidance subscale have been reported (Brennan et al., 1998), and test-retest reliabilities over a six month interval indicate coefficients of .68 for attachment anxiety and .71 for attachment avoidance (Lopez & Gormley, 2002). Given that attachment orientation is generally understood as a stable construct, these test-retest reliabilities are lower than expected. However, these reliabilities vary depending on the sample assessed and the interval between assessments (Mikulincer & Shaver, 2007). Transient situational stressors or experiences may also impact the extent to which participants endorse items reflecting high anxiety or high avoidance. In the current study, Cronbach alphas were .88 and .89 for the Anxious and Avoidance subscales, respectively (see Table 1).

*Social support seeking.* Participants completed selected subscales from two instruments that measure support seeking behaviours. The first measure, the Strategy and Attribution Questionnaire (SAQ; Nurmi, Salmela-Aro & Haavisto, 1995), assesses social support seeking and social avoidance tendencies. This 60-item self-report measure includes nine subscales: Success Expectations, Task-irrelevant Behaviour, Seeking Social Support, Reflective thinking, Master-orientation in an Achievement Situation, Success Expectations, Task-irrelevant Behaviour, Avoidance, Master-orientation in an Affiliative Context, and Pessimism in Social Situations (Nurmi et al., 1995). Subscales selected for use in the current study were (a) the Seeking Social

Support subscale (e.g., I know people who I can get support from), and (b) the Avoidance subscale (e.g., I avoid group situations and prefer to spend my time alone or with one other person). The Seeking Social Support subscale measures individuals' typical behavioural patterns when seeking social support from others and the Avoidance Subscale assesses social constraint, withdrawal, and individuals' proclivity to avoid social situations.

On the SAQ, respondents rate their agreement with various statements on a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). Each subscale is composed of six items; subscale scores can range from 6 to 24. Higher scores indicate a greater proclivity to seek social support and greater avoidance tendencies. Nurmi et al., (1995) reported that alpha coefficients of .81 for seeking social support and .83 for avoidance of social support and test-retest reliabilities over a six month interval indicate coefficients of .89 for seeking social support and .88 for avoidance. In the present study, alpha coefficients were .74 for seeking social support and .82 for the avoidance subscale (see Table 1).

The COPE Scale (Carver, Scheier, & Weintraub, 1989) was selected for use in the current study to evaluate indirect and ineffective methods in seeking support. The COPE was developed through factor analysis of responses from 978 undergraduates. Twelve dimensions of coping were identified: Active Coping, Planning, Seeking Instrumental Social Support, Seeking Emotional Social Support, Suppression of Competing Activities, Positive Reinterpretation and Growth, Restraint Coping, Acceptance, Focus on and Venting of Emotions, Denial, Mental Disengagement, and Behavioural Disengagement (Carver et al., 1989). Three coping dimensions were used in the current study, (a) the Seeking Social support for Instrumental Reasons subscale (e.g., I ask people who have had similar experiences what they did), (b) the Seeking Social Support for Emotional Reasons subscale (e.g., I discuss my feelings with

someone), and (c) the Focus on and Venting of Emotions subscale (e.g., I get upset and let my emotions out). In the current study, the Focusing on and Venting Emotions factor was conceptualized as an indirect method of seeking social support. This is in line with the findings that seeking out emotional social support, which may include ventilation of an individual's feelings, may not always be adaptive (Berman & Turk, 1981; Billings & Moos, 1984; Costanza, Derlega, & Winstead, 1988; Tolor & Fehon, 1987).

Respondents to the 48-item COPE Scale are asked to indicate their typical response when they experience difficult or stressful life events. Each item is rated on a 4-point Likert scale: 1 (I usually don't do this at all), 2 (I usually do this a little bit), 3 (I usually do this a medium amount) and 4 (I usually do this a lot). Alpha coefficients for Seeking Social Support for Instrumental Reasons, Seeking Social Support for Emotional Reasons, and Focus on and Venting of Emotions range from .75 to .85, and test-retest correlations range from .64 to .77 (Carver et al., 1989). In the current study, alpha coefficients for these subscales range from .73 to .84 (see Table 1).

Additional questions, based on Barbee and Cunningham's (1995) coding scheme, which assesses indirect social support seeking behaviours, were constructed for the current study and appended to the COPE Scale (See Appendix G). In Barbee and Cunningham's (1995) coding scheme, four types of support seeking strategies are coded: a direct-verbal strategy (e.g., asking directly for help); a direct-nonverbal strategy (e.g., displaying expressions of distress and behaviours such as crying); an indirect-verbal strategy (e.g., complaining without directly asking for help); and an indirect-nonverbal strategy (e.g., displaying negative affect by sighing or sulking). Based on these four types of support seeking strategies, Barbee and Cunningham (1995) found three higher-order indexes of support seeking: Emotional Disclosure, Instrumental Disclosure, and Indirect Support Seeking. The Indirect Support Seeking index is relevant to the current study. Indirect Support Seeking is the sum of the indirect-verbal

and indirect-nonverbal strategies. Therefore, the constructed items which assess indirect support seeking were based on the indirect-verbal and indirect-nonverbal strategies characterized in the coding scheme.

Six items were constructed (i.e., I complain about the situation, without requesting help from others; I fidget when I am with someone; I sigh when I am with someone; I sulk when I am with someone; I ask others for help; I hint to others that a problem exists). Like the COPE Scale, each item is rated on a 4-point Likert scale: 1 (I usually don't do this at all), 2 (I usually do this a little bit), 3 (I usually do this a medium amount) and 4 (I usually do this a lot). One item was removed from this scale (i.e., I fidget when I am with someone) because it did not correlate substantially with the other items or the overall total and one item was removed (e.g., I ask others for help) because it is not categorized as an indirect method of seeking support. Therefore, these four indirect social support seeking items and the Venting Subscale of the COPE were appended and used as an overall assessment of indirect social support seeking. In the current study, the alpha coefficient for this overall Indirect Social Support Seeking measure was .75 (see Table 1).

*Loneliness.* Participants completed two measures of loneliness. The University of California, Los Angeles, Loneliness Scale (Version 3); (UCLA-Loneliness Scale; Russell, 1996) is a unidimensional measure of loneliness that has been widely employed in research on this topic. Version 3 of the UCLA Loneliness Scale is a simplified version of the scale which includes 20 items that assess the degree of self-reported loneliness in everyday life. The measure includes nine positive or non-lonely items (e.g., How often do you feel you can find companionship when you want it?) and 11 negative or lonely items (e.g., How often do you feel your relationships with others are not meaningful?). Each item is rated on a 4-point Likert scale ranging from 1 (never) to 4 (always) and scores range from 20 to 80; higher scores reflect greater loneliness. Coefficient alphas



for the UCLA-Loneliness Scale are reported to range from .89 to .94 (Russell, 1996). The Cronbach alpha in the current study was .92 (see Table 1). Moderately high correlations of .65 and .72 with scores on the New York University (NYU) Loneliness Scale and the Differential Loneliness Scale, respectively, support this scale's convergent validity (Russell, 1996).

A multidimensional measure of loneliness, which assesses social and emotional loneliness, was also employed. Scores on the Social and Emotional Loneliness Scale for Adults (SELSA; DiTommaso & Spinner, 1993) were used in exploratory analyses to gain a better understanding of the relationship between adult attachment dimensions, social and emotional loneliness, and depression. The SELSA contains 37 items; each item is rated on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). Total scores on the SELSA can range from 37 to 259; higher scores suggest greater loneliness. The SELSA also yields scores on three subscales: Romantic Emotional Loneliness, Family Emotional Loneliness, and Social Loneliness. Reported alpha coefficients for these subscales range from .89 to .93 (DiTommaso et al., 2003). In the current study, the Cronbach alphas were .83, .90, and .87 for Romantic Emotional Loneliness, Family Emotional Loneliness, and Social Loneliness, respectively (see Table 1). The Cronbach alpha for the Emotional Loneliness Subscale (i.e., both Romantic and Family Emotional Loneliness) was .80. DiTommaso and Spinner (2003) also report concurrent correlations of .79, .40, and .37 between the social, romantic, and family subscales, respectively, and the revised UCLA Loneliness Scale. Relationships between attachment, *social* loneliness, and depression in the current study were expected to be similar to the findings based on the UCLA Loneliness Scale. However, relationships between attachment, *emotional* loneliness (i.e., romantic and family loneliness), and depressive symptoms were expected to differ from findings based on the UCLA Loneliness Scale.

## Results

### Overview and Sequence of Analyses

Prior to performing the analyses, the integrity of the data set was assessed and decisions were made regarding how to address problems such as missing data and outliers, and to establish that assumptions were met for multivariate analyses. Internal consistencies were calculated for measures used in the study and descriptive statistics were calculated for all study variables. Correlational and multivariate analyses were conducted to test hypotheses. Ancillary analyses were conducted as indicated. Analyses were conducted using SPSS 16.0 (SPSS, Inc., 2007) and AMOS 17.0 (Arbuckle, 2009). Alpha was set at .05 for all analyses.

### Data Management

*Treatment of missing data.* Mean replacement, which addresses possible bias, was used to substitute the missing values in the data set. Particularly, three cases contained missing values on the Centre of Epidemiologic Studies – Depression Scale (CES-D) and six cases contained missing values on the Social and Emotional Loneliness Scale for Adults (SELSA).

*Treatment of outliers.* The presence of univariate outliers in the data set was assessed by scanning the standardized residual values (z-scores). Outliers, with standardized residual absolute values above three, as recommended by Kline (2005), were not identified for any of the variables, and therefore, outliers were not removed from the data set. Influential observations (outliers on both x and y) were not identified when using Cook's Distance criterion (i.e., Cook's Distance greater than one is problematic) or the standardized DfFIT criterion (i.e. absolute values greater than two are considered influential). As indicated by AMOS 17.0, multivariate outliers were not identified based on Mahalanobis' distance ( $p < .001$ ).

*Internal consistency of measures.* Cronbach's alpha coefficients were used as a measure of internal consistency and were computed for all variables. All Cronbach alpha values were within an acceptable range, with the exception of the interpersonal factor of the CES-D ( $\alpha = .57$ ); see Table 1.

### Descriptive Data

*Attachment categories.* Based on the two screening questions that undergraduates completed when registering for the participant pool, 20 (11.8%) participants were categorized as anxious, 35 (20.7%) were categorized as avoidant, and 16 (9.5%) were categorized as both anxious and avoidant (7 participants were not classified). It may be inferred that the 91 (53.8%) undergraduates that did not endorse either of the screening questions could be described as securely attached individuals.

Hazen and Shaver (1987) found that when using the three statements reflective of secure, avoidant, and anxious styles, 56% of participants endorsed a secure attachment style, 24% of participants endorsed an avoidant attachment style, and 20% of participants endorsed an anxious attachment style.

Brennan et al. (1998) provides a formula to classify people into type categories based on their dimensional scores on the Experiences in Close Relationships (ECR) inventory. Using this formula, 38 (22.5%) of the participants in the current study were classified as secure, 73 (43.2%) were classified as fearful avoidant (high on anxiety; high on avoidance), 32 (18.9%) were preoccupied (high on anxiety), and 26 (15.4%) were dismissing avoidant (high on avoidance).<sup>1</sup> However, it is important to note that Brennan et al.'s (1998) formula to classify attachment types based on the ECR is not recommended because the classification equation is misleading. Therefore, this formula

<sup>1</sup> Individuals classified as fearful avoidant may correspond with individuals who responded yes to both the anxious and avoidant screening questions; preoccupied attachment may correspond with anxious attachment, and dismissing avoidant attachment may correspond with avoidant attachment.

was used to crudely identify the number of participants with each attachment style.

However, as recommended, dimensional scores themselves were used in the statistical analyses. Means and standard deviations based on attachment styles are available in Table 2.

The correspondence between the screening questions and attachment category, as assessed by the ECR was 32.97% for secure individuals. In other words, 32.97% of individuals that were identified as secure based on the screening questions were also identified as secure based on the ECR. The correspondence between the screening questions and the ECR was 56.25% for “both anxious and avoidant attachment” (fearful avoidant), 40% for anxious attachment (preoccupied), and 20% for avoidant attachment (dismissing avoidant).

Means and standard deviations on important study variables are presented in Table 3.

***Participants living at home compared to participants living away from home.*** Between-group comparisons were conducted to assess for possible mean differences between participants living at home with those living away from home. As shown in Table 4, undergraduates who lived at home were significantly younger than undergraduates who lived away from home.

***Female students compared to male students.*** Between-group comparisons were conducted to assess for possible mean differences between female students and male students on major study variables. In the current study, male participants were older than female participants and male participants reported higher levels of loneliness. Female undergraduates reported greater use of support seeking behaviours based on the SAQ Support Seeking subscale, and greater use of seeking both instrumental and emotional support. Compared to male participants, female participants were also

Table 2.

*Means and standard deviations based on attachment categories*

Variable	Attachment Category	<i>N</i>	<i>Mean</i>	<i>SD</i>
Attachment Anxiety	ECR: Secure	38	2.73	.55
	ECR: Fearful	73	4.20	.59
	ECR: Preoccupied	32	4.63	.59
	ECR: Dismissing	26	2.79	.50
Attachment Avoidance	ECR: Secure	38	2.48	.35
	ECR: Fearful	73	4.06	.74
	ECR: Preoccupied	32	2.76	.48
	ECR: Dismissing	26	3.84	.88

Table 3.

*Means and standard deviations for the total sample (N =169)*

Variable	<i>M</i>	<i>SD</i>
ECR Attachment-related Anxiety	3.73	.96
ECR Attachment-related Avoidance	3.42	.96
CES – D Total Score	19.95	10.99
CES – D Depression Factor	6.22	4.94
CES – D Somatic Factor	8.91	3.91
CES – D Positive Affect Factor	3.67	2.84
CES – D Interpersonal Factor	1.14	1.30
UCLA – Loneliness Scale Total Score	40.66	9.92
SELSA Social Loneliness Subscale	26.29	11.45
SELSA Romantic EL	39.18	14.80
SELSA Family EL	26.13	12.83
SAQ Avoidance	12.38	3.77
SAQ Support Seeking	18.31	2.77
COPE Instrumental	10.93	2.65
COPE Emotional	10.46	3.09
COPE Venting	8.88	2.95
Indirect Social Support Seeking Total Score	16.54	4.49

*Note.* EL = Emotional Loneliness; SSS = Social Support Seeking

Table 4.

*Mean comparisons between students living at home (N=119) and students living away from home (N=50)*

Variable	Mean	SD	Range	t Statistic	p Value
<b>Male</b>					
At home	N=19	11.24%			
Away	N=23	13.61%			
<b>Female</b>					
At home	N=100	78.74%			
Away	N=27	15.98%			
<b>Age</b>					
At home	18.06	.61	17-20	2.82	.01**
Away	18.38	.81	17-20		
<b>ECR – Anxiety</b>					
At home	3.69	1.00	1.1-6.5	1.02	.31
Away	3.85	.87	1.9-5.5		
<b>ECR – Avoidance</b>					
At home	3.40	1.00	1.6-6.4	.42	.68
Away	3.47	.84	1.9-5.5		
<b>CES – D Total Score</b>					
At home	20.06	11.39	1 - 51	-.20	.84
Away	19.68	10.06	4 - 45		
<b>CES – D Depression</b>					
At home	6.32	5.23	0 - 21	-.41	.69
Away	5.98	4.22	0 - 16		
<b>CES – D Somatic</b>					
At home	8.87	4.02	0 - 21	.19	.85
Away	9.00	3.66	2 - 18		

CES – D Positive Affect					
At home	3.78	2.86	0 - 11	-.76	.45
Away	3.42	2.79	0 - 9		
CES – D Interpersonal					
At home	1.08	1.29	0 - 6	.90	.37
Away	1.28	1.31	0 - 4		
UCLA – Loneliness					
At home	40.42	10.45	22 - 69	.48	.63
Away	41.22	8.59	30 – 63		
SELSA SL					
At home	26.50	12.41	10 - 67	-.36	.72
Away	25.80	8.79	10 - 49		
SELSA Romantic EL					
At home	39.55	14.77	10 - 70	-.50	.62
Away	38.30	14.98	10 - 68		
SELSA Family EL					
At home	25.23	12.32	10 - 70	1.42	.16
Away	28.28	13.87	10 - 61		
SAQ Avoidance					
At home	12.39	4.07	6 - 23	-.04	.97
Away	12.36	3.00	8 - 19		
SAQ Seeking Support					
At home	18.50	2.93	9 - 23	-1.38	.17
Away	17.86	2.32	11 - 23		
COPE Instrumental					
At home	10.99	2.62	4 - 16	-.47	.64
Away	10.78	2.76	5 - 16		
COPE Emotional					
At home	10.64	3.07	4 - 16	-1.15	.25
Away	10.04	3.14	4 - 16		
COPE Venting Emotion					
At home	9.00	2.96	4 - 16	-.85	.40
Away	8.58	2.91	4 - 14		



## Indirect SSS Total

At home	16.82	4.59	9 - 30	-1.21	.25
Away	15.90	4.21	9 - 24		

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\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$  (two-tailed test)

*Note.* SL = Social Loneliness; EL = Emotional Loneliness; SSS = Social Support Seeking

more likely to use venting of emotions as a method of support seeking and use indirect social support seeking behaviours (see Table 5).

***Caucasian participants compared to non-Caucasian participants.***

Individuals from different cultures may have different behavioural tendencies when seeking support and different expectations in their interpersonal relationships. These differences provide reason to compare individuals from different cultures. It would be ideal to address concerns about possible confounds arising from racial/ethnic diversity in the sample through data analyses. However, based on the racial distribution of the current study, it is not feasible to compare across all racial/ethnic groups. Between group comparisons, however, were conducted to assess for possible mean differences between Caucasian and non-Caucasian students on study variables. In the current study, non-Caucasian participants scored higher on attachment-related avoidance compared to Caucasian participants. Caucasian students reported greater use of: social support seeking as assessed by the SAQ, emotional support seeking, venting of emotions, and indirect support seeking, compared to non-Caucasian students (see Table 6).

**Correlational Analyses**

Correlational analyses were conducted to test Hypotheses one through six. Bivariate correlations were one-tailed, Pearson product-moment correlations unless otherwise specified. Field (2005) indicates that one-tailed tests should be used when there is a specific direction to the hypothesis being tested, whereas two-tailed analyses should be used when the direction of the relationship is not predicted (p. 125). In the current study, specific directional hypotheses were outlined and therefore, one-tailed analyses were used.

Table 5.  
Mean comparisons between females (N=127) and males (N=42)

Variable	Mean	SD	Range	<i>t</i> Statistic	<i>p</i> Value
% (N) Live Away					
Female	46 %	N=27			
Male	54 %	N=23			
Age					
Female	18.08	.60	17 - 20	2.50	.01**
Male	18.38	.88	17 - 20		
Time Living Away					
Female	2.46	.98	1 - 12	-1.25	.22
Male	2.16	.62	1 - 4		
ECR – Anxiety					
Female	3.67	.98	1.1-6.2	1.47	.14
Male	3.92	.91	2.2-6.5		
ECR – Avoidance					
Female	3.37	.96	1.7-6.4	1.32	.19
Male	3.59	.92	1.6–6.1		
CES – D Total Score					
Female	19.91	10.92	1 - 51	.09	.93
Male	20.07	11.31	3 - 47		
CES – D Depression					
Female	6.35	4.90	0 - 21	-.62	.54
Male	5.81	5.09	0 - 21		
CES – D Somatic					
Female	8.75	3.94	0 - 21	.94	.35
Male	9.40	3.82	1 - 18		
CES – D Positive Affect					
Female	3.72	2.84	1 - 11	-.33	.74
Male	3.55	2.86	0 - 10		
CES – D Interpersonal					
Female	1.09	1.22	0 - 5	.87	.39

Male	1.31	1.51	0 - 6		
UCLA – Loneliness Scale					
Female	39.47	9.69	22 - 63	2.75	.01**
Male	44.24	9.84	30 - 69		
SELSA Social Loneliness					
Female	25.43	11.14	10 - 67	1.72	.09
Male	28.90	12.05	14 - 60		
SELSA Romantic EL					
Female	38.06	15.18	10 - 70	1.72	.09
Male	42.57	13.16	10 - 68		
SELSA Family EL					
Female	25.81	12.94	10 - 70	.56	.58
Male	27.10	12.59	10 - 61		
SAQ Avoidance					
Female	12.16	3.74	6 - 23	1.33	.19
Male	13.05	3.83	8 - 23		
SAQ Seeking Support					
Female	18.67	2.59	10 - 23	-2.97	.00***
Male	17.24	3.03	9 - 23		
COPE Instrumental					
Female	11.16	2.66	4 - 16	-1.96	.05*
Male	10.24	2.55	5 - 15		
COPE Emotional Support					
Female	10.88	3.08	4 - 16	-3.16	.00***
Male	9.19	2.79	4 - 15		
COPE Venting Emotion					
Female	9.17	3.00	4 - 16	-2.25	.03*
Male	8.00	2.60	4 - 14		
Indirect SSS Total Score					
Female	16.96	4.63	9 - 30	-2.12	.04*
Male	15.29	3.80	9 - 23		

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$  (two-tailed test)

Note. EL = Emotional Loneliness; SSS = Social Support Seeking

Table 6

*Mean comparisons between Caucasians (N=124) and non-Caucasians (N=44)*

Variable	Mean	SD	Range	t statistic	p value
<b>% (N) Live Away</b>					
Caucasian	58 %	N=29			
Non-Caucasian	42%	N=21			
<b>Age</b>					
Caucasian	18.10	.63	17 - 20	-1.49	.14
Non-Caucasian	18.27	.79	17 - 20		
<b>Time Living Away</b>					
Caucasian	2.80	2.13	1 - 12	-.77	.47
Non-Caucasian	3.26	2.53	1 - 11		
<b>ECR – Anxiety</b>					
Caucasian	3.72	.96	1.2-6.5	-.23	.82
Non-Caucasian	3.76	.99	1.1-5.5		
<b>ECR – Avoidance</b>					
Caucasian	3.33	.94	1.6-6.4	-2.28	.02*
Non-Caucasian	3.71	.95	2.1-6.3		
<b>CES – D Total Score</b>					
Caucasian	20.24	11.03	3 - 51	.64	.52
Non-Caucasian	19.00	11.03	1 - 47		
<b>CES – D Depression</b>					
Caucasian	6.39	4.87	0 - 21	.68	.50
Non-Caucasian	5.80	5.21	0 - 21		
<b>CES – D Somatic</b>					
Caucasian	8.94	3.89	1 - 21	.42	.67
Non-Caucasian	8.66	3.89	0 - 18		
<b>CES – D Positive Affect</b>					
Caucasian	3.68	2.87	0 - 11	.08	.94
Non-Caucasian	3.64	2.79	0 - 9		
<b>CES – D Interpersonal</b>					
Caucasian	1.23	1.30	0 - 6	1.43	.15

Non-Caucasian	.91	1.27	0 - 4		
UCLA – Loneliness Scale					
Caucasian	40.51	9.87	23 - 68	-.48	.63
Non-Caucasian	41.34	10.08	22 - 69		
SELSA Social Loneliness					
Caucasian	26.06	11.17	10 - 67	-.48	.63
Non-Caucasian	27.02	12.37	11 - 60		
SELSA Romantic EL					
Caucasian	38.02	15.37	10 - 70	-1.84	.07
Non-Caucasian	42.77	12.60	19 - 68		
SELSA Family EL					
Caucasian	26.65	12.76	10 - 70	.99	.33
Non-Caucasian	24.43	13.10	10 - 61		
SAQ Avoidance					
Caucasian	12.12	3.71	6 - 23	-1.57	.12
Non-Caucasian	13.16	3.92	6 - 23		
SAQ Seeking Support					
Caucasian	18.56	2.60	11 - 23	2.17	.03*
Non-Caucasian	17.52	3.10	9 - 22		
COPE Instrumental					
Caucasian	11.11	2.57	4 - 16	1.51	.13
Non-Caucasian	10.41	2.86	4 - 16		
COPE Emotional Support					
Caucasian	10.82	3.00	4 - 16	2.60	.01**
Non-Caucasian	9.43	3.19	4 - 16		
COPE Venting Emotion					
Caucasian	9.17	2.85	4 - 16	2.15	.03*
Non-Caucasian	8.07	3.13	4 - 15		
Indirect SSS Total Score					
Caucasian	16.98	4.33	10 - 29	2.60	.01**
Non-Caucasian	15.32	4.79	9 - 30		

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$  (two-tailed test)

Note. EL = Emotional Loneliness; SSS = Social Support Seeking

The correlation matrix is presented in Table 7. For the correlational analyses, attachment-related anxiety and attachment-related avoidance were assessed using each respective subscale of the ECR, depressive symptoms were assessed using the CES – D total score, loneliness was assessed using the UCLA total score, avoidance of social support seeking was assessed using the SAQ Avoidance subscale, and indirect social support seeking was assessed using the Indirect Social Support Seeking total score (i.e., the Venting Emotions subscale of the COPE and the items constructed specifically for the current study).

**Hypothesis 1. Attachment-related anxiety and attachment-related avoidance will both be positively associated with depressive symptoms.** As predicted, a significant positive association between attachment-related anxiety and depressive symptoms, was revealed, ( $r = .56$ ,  $p$  (one-tailed)  $< .001$ ). Similarly, attachment-related avoidance and depressive symptoms were also positively correlated ( $r = .38$ ,  $p$  (one-tailed)  $< .001$ ).

**Hypothesis 2. Attachment-related anxiety and attachment-related avoidance will both be positively associated with loneliness.** As hypothesized, both attachment-related anxiety and attachment-related avoidance were positively correlated with loneliness, ( $r = .58$ ,  $p$  (one-tailed)  $< .001$  and  $r = .67$ ,  $p$  (one-tailed)  $< .001$ ) for anxious and avoidant attachment, respectively.

**Hypothesis 3. Attachment-related anxiety will be positively associated with indirect and ineffective social support seeking behaviours.** In accordance with the hypothesis, attachment-related anxiety was significantly correlated with indirect social support seeking strategies ( $r = .42$ ,  $p$  (one-tailed)  $< .001$ ). Although not directly hypothesized, it is worth noting that attachment-related avoidance was negatively associated with indirect social support seeking strategies, ( $r = -.12$ ,  $p$  (one-tailed)  $> .05$ ).

Table 7  
*Bivariate Pearson correlation coefficients (N = 169)*

Variable	1	2	3	4	5	6
1. Anxious Attachment	1					
2. Avoidant Attachment	.31***	1				
3. Depressive Symptoms	.56***	.38***	1			
4. Loneliness	.58***	.67***	.55***	1		
5. Avoidant Support Seeking	.46***	.51***	.48***	.69***	1	
6. Indirect Support Seeking	.42***	-.12	.35***	.13*	.13*	1

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$  (one-tailed)



**Hypothesis 4. Attachment-related avoidance will be positively associated with avoidant support seeking behaviours.** In line with the hypothesis, attachment-related avoidance was significantly associated with avoidance of social support seeking ( $r = .51, p$  (one-tailed)  $< .001$ ), indicating that individuals with higher scores on the avoidant attachment orientation are less likely to seek support from others. Similarly, although not hypothesized, the correlation analyses reveal that attachment-related *anxiety* is positively correlated with avoidance of social support seeking behaviour ( $r = .46, p$  (two-tailed)  $< .001$ ). Therefore, individuals with either an anxious or an avoidant attachment orientation report greater avoidance of social support seeking.

**Hypothesis 5. Indirect social support seeking behaviours and avoidant social support seeking behaviours will be positively associated with loneliness.** In line with the prediction that indirect social support seeking strategies would be positively correlated with loneliness, a significant correlation was revealed ( $r = .13, p$  (one-tailed)  $< .05$ ). Similarly, the hypothesis stating that avoidance of social support seeking would be positively associated with loneliness was supported, ( $r = .69, p$  (one-tailed)  $< .001$ ).

**Hypothesis 6. Loneliness will be positively associated with depressive symptomatology.** An evaluation of the correlation between loneliness and depressive symptoms revealed a significant relationship between these variables. As predicted, loneliness was positively associated with depressive symptomatology ( $r = .55, p$  (one-tailed)  $< .001$ ).

#### Meeting Statistical Assumptions for Multivariate Analyses

Structural Equation Modeling (SEM) was chosen as the approach to multivariate analysis in the current study over regression modelling for the following reasons: 1) It allows for better model visualization; 2) The overall fit of the model is appropriately tested rather than testing coefficients individually; 3) Multiple endogenous (dependent)

variables are evaluated, 4) Mediating variables are included in the model and not simply restricted to an additive model, and 5) Model fit comparisons with alternative models are permissible. Prior to conducting Structural Equation Modeling, the data set was examined to ensure statistical assumptions for SEM analyses were met.

*Sample size.* Steven (1996) recommends that at least 15 cases per measured variable or indicator should be available for SEM analyses. The 169 cases available in the current study satisfied this condition, which indicated that 135 cases are necessary.<sup>2</sup>

*Linearity.* Visual inspections of the histograms of the variables in the current study appeared to be normal. Tests of skewness and kurtosis, computed by SPSS 16.0 and AMOS 17.0 did not exceed their respective critical values, and therefore, the univariate normality assumption was satisfied for all variables. The multivariate kurtosis statistic of 1.842 and the critical value of 1.728, computed by AMOS 17.0, demonstrated a negligible deviation from multivariate normality.

*Homoscedasticity.* Scatter plots of the standardized predicted values and the standardized residual values were evaluated to investigate whether homoscedasticity was satisfied and whether a linear relationship existed between the latent variable and its indicators (i.e., the depressive symptoms latent variable and its indicators). The evenly distributed residuals (variance) around the predicted scores line indicates that the homoscedasticity assumption was satisfied. An inspection of bivariate scatterplots also

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<sup>2</sup> According to G\*Power (Faul & Erdfelder, 1992), a general power analysis program, when alpha is set at .05, effect size at .30 (medium effect size), and power at .95, the required number of participants is 111 for Pearson correlations. For chi-square analyses (SEM), when alpha is set at .05, effect size at .50 (large effect size), power at .95, and degrees of freedom (df) at 19 (total df in final model), 121 participants are required. Therefore, a sufficient number of participants were included in the current study to detect a large effect size for the SEM analyses. However, for chi-square analyses (SEM), when alpha is set at .05, effect size at .30 (medium effect size), power at .95, and degrees of freedom (df) at 19 (total df in final model), 336 participants are required.

demonstrates that the linearity assumption was satisfied for the pairs of variables of interest.

*Multicollinearity.* A visual investigation of the correlations matrix revealed that very large correlations (i.e.,  $r > .9$ ) were not present, and thus, the multicollinearity assumption was not violated. Tolerance and the variance inflation factor (VIF) values were assessed and confirm the absence of multicollinearity.<sup>3</sup> Based on the evaluation of these assumptions, it is appropriate to conduct SEM analyses in the current study.

### Structural Equation Modeling (SEM)

Average scores for attachment-related anxiety and attachment-related avoidance were computed based on the Experiences in Close Relationships Inventory (ECR) subscales. Sum scores of the following inventories were computed: the Avoidance subscale of the Strategy and Attribution Questionnaire (SAQ); the Indirect Social Support Seeking measure (i.e., Venting subscale of the COPE and the constructed items); and the UCLA – Loneliness Scale. These sum scores served as measurements of reluctance to seek support, indirect support seeking, and loneliness, respectively. The CES-D inventory was parceled into four factors, based on Randloff's (1977) Principal Components Factor Analysis: Depressed Affect (7 items), Positive Affect (4 items), Somatic and Retarded Activity (7 items), and Interpersonal (2 items).<sup>4</sup>

The structural equation modeling analyses were conducted in two sets. As recommended by Anderson and Gerbing (1988) and Kline (2005), in the first set of analyses, the fit of the measurement model was assessed using a confirmatory factor

<sup>3</sup> Since all tolerance values were greater than .10 and the VIF values did not exceed 10, the multicollinearity assumption was not violated.

<sup>4</sup> A parcel is an "aggregate-level indicator that is comprised of the sum (or average) of two or more items, responses, or behaviours" (Little et al., 2002). It is preferred to use parcels, rather than individual items when relatively small sample sizes exist because fewer parameters are required (e.g., Bagozzi & Edwards, 1998)

analysis.<sup>i</sup> The second set of analyses examined the overall structural model, or simply the direct association between the variables under investigation.

*Measurement model.* Four goodness of fit indices were used in the current study: the chi-square statistic, the comparative fit index (CFI), Bollen's incremental fit index (IFI), and the root mean square of approximation (RMSEA). A non-significant chi-square statistic suggests a very good fit. CFI values range from zero to one; values over 0.90 suggest reasonably good fit and values above 0.95 signify very good fit. The IFI abides by the same criteria as the CFI (Byrne, 2001). RMSEA values also range from zero to one. Values between 0.05 and 0.08 indicate reasonably good fit and values greater than .10 are classified as unacceptable (Byrne, 2001). Chi-square difference tests were used to test nested model comparisons.<sup>ii</sup>

The measurement model, Figure 3, tested the fit of the data when the depressive symptoms construct was measured as a latent variable with four indicators (depression factor, somatic factor, positive affect, and interpersonal factor). This measurement model resulted in a good fit of the data,  $\chi^2(2, N=169) = .29, p>.05$ ; CFI=1.00, IFI=1.00, RMSEA=.00 (90%CI:.000-.080).<sup>5</sup> As shown in Table 8, each direct effect (factor loading) from the depressive symptoms latent variable to each parcel was statistically significant ( $p<.001$ ). This measurement model was used in the final structural model analyses. Kline (2005, p.172) reports that measurement models with one latent variable are identified models provided that the latent variable has at least three indicators. This condition is satisfied in the current study since the latent variable has four indicators.

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<sup>5</sup> Although the indicators serve as an adequate measurement of the depressive symptoms latent construct, Kline (2005) describes that a RMSEA value of .00 and CFI and IFI values of 1.00 do not necessarily suggest "perfect" model fit.

Figure 3.

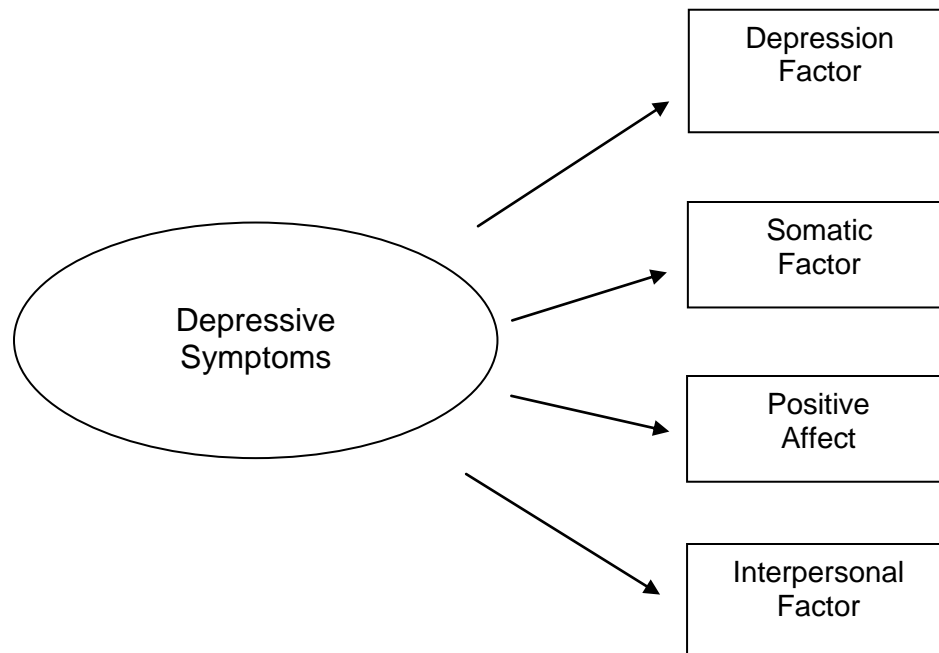
*Measurement Model*

Table 8.

*Standardized regression weights between the depression latent variable and the parcels*

Latent Variable	Parcel	Factor Loading
Depressive Symptoms	Depression Factor	.88***
	Somatic Factor	.80***
	Positive Affect Factor	.74***
	Interpersonal Factor	.53***

\*\*\*  $p < .001$

The original hypothesized model (Figure 1; see page 4) was tested and depicted a poor fit to the data,  $\chi^2(22, N=169) = 101.80, p < .001$ ; CFI=.89, IFI=.89, RMSEA=.147 (90%CI:.119-.176). Two nested model comparisons were performed in order to determine whether indirect social support seeking behaviours and avoidance of support seeking served as distinct mediators. To evaluate whether indirect support seeking was a distinct mediator for attachment-related anxiety, the direct path from attachment-related *avoidance* to indirect social support seeking was added to the original model. This added path resulted in a poor fit to the data,  $\chi^2(21, N=169) = 89.86, p < .001$ ; CFI=.90, IFI=.90, RMSEA=.140(90%CI:.111-.170). A significant chi-square difference test,  $\chi^2_D(1, N=169) = 11.94, p < .001$  indicates that the added path from attachment-avoidance to indirect support seeking improves model fit and should be retained. However, avoidant attachment is negatively predictive of indirect support seeking, and therefore, as predicted, indirect support seeking does not mediate the relationship between avoidant attachment and loneliness, and subsequent depression.

The next alternative model was tested to determine whether reluctance to seek support served as a distinct mediator between attachment-related avoidance, loneliness, and subsequent depression. A direct path from attachment-related *anxiety* to reluctance to seek support was added to the original model. This (second) alternative model depicted a fair fit of the data,  $\chi^2(21, N=169) = 77.70, p < .001$ ; CFI=.92, IFI=.92, RMSEA=.127(90%CI:.097-.158). A significant chi-square difference test,  $\chi^2_D(1, N=169) = 24.11, p < .001$  suggests that adding this path improves the fit of the original model and this path should be retained. Contrary to our predictions, this alternative model indicates that reluctance to seek support does not serve as distinct mediator for avoidant attachment.

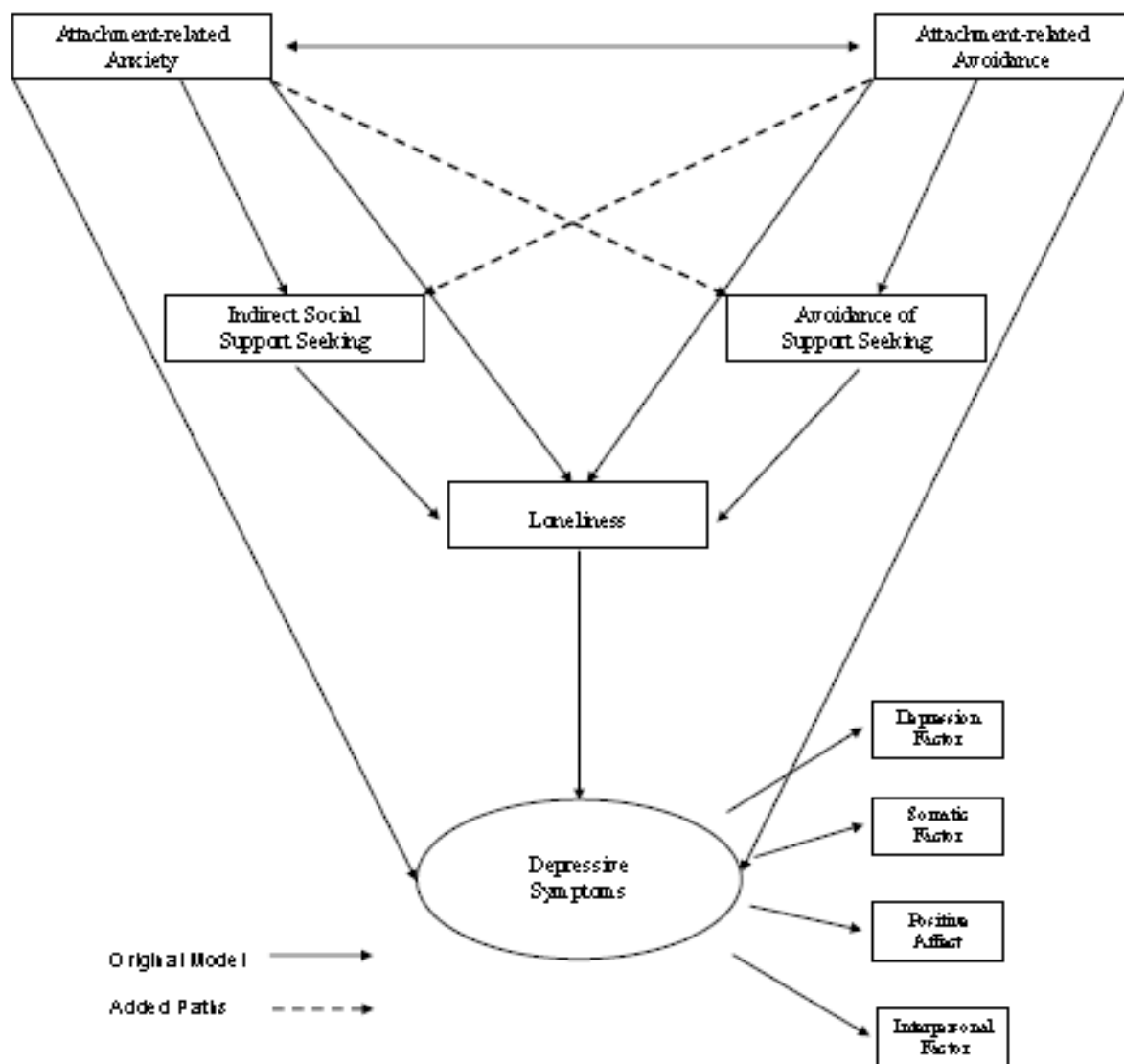
Based on the findings that the two alternative models outlined above improve the model fit, these paths (i.e., a direct path from avoidant attachment to indirect support seeking and a direct path from anxious attachment to avoidant support seeking), were added to the original model. The new model, shown in Figure 4, resulted in an adequate fit of the data,  $\chi^2(20, N=169) = 65.756, p < .001$ ; CFI=.94, IFI=.94, RMSEA=.117 (90%CI:.086-.149). The statistically significant chi-square difference test,  $\chi^2_D(2, N=169) = 36.05, p < .001$ , supports the finding that the two added paths fits the data better compared to the original model.

Based on the modification indices, a path between indirect social support seeking and depressive symptoms was added to the model and indicated an adequate fit to the data,  $\chi^2(19, N=169) = 55.39, p < .001$ ; CFI=.95, IFI=.95, RMSEA=.107(90%CI:.075-.140). This added path improved the overall fit of the model,  $\chi^2_D(1, N=169) = 10.36, p < .001$ , and therefore, the path was retained in the model. It is worth noting that although the RMSEA value exceeds the cut off criterion, the lower bound value of its confidence interval falls within the acceptable range, which suggests that it provides a good approximate fit.

Two non-significant paths, one from avoidant attachment to depressive symptoms and the other from indirect social support to loneliness were found in the overall model. The path from indirect social support seeking to loneliness was removed from the model to evaluate whether the model fit improved. The removal of this non-significant path did not improve the overall fit of the model as indicated by the non-significant chi-square difference test,  $\chi^2_D(1, N=169) = .003, n.s.$  Typically, the more parsimonious model (i.e., the model with fewer paths) is retained when a non-significant chi-square statistic is indicated. However, because these are exploratory analyses based on the modification indices of the current data set, the non-significant path was



Figure 4.  
Original Model with Two Added Paths



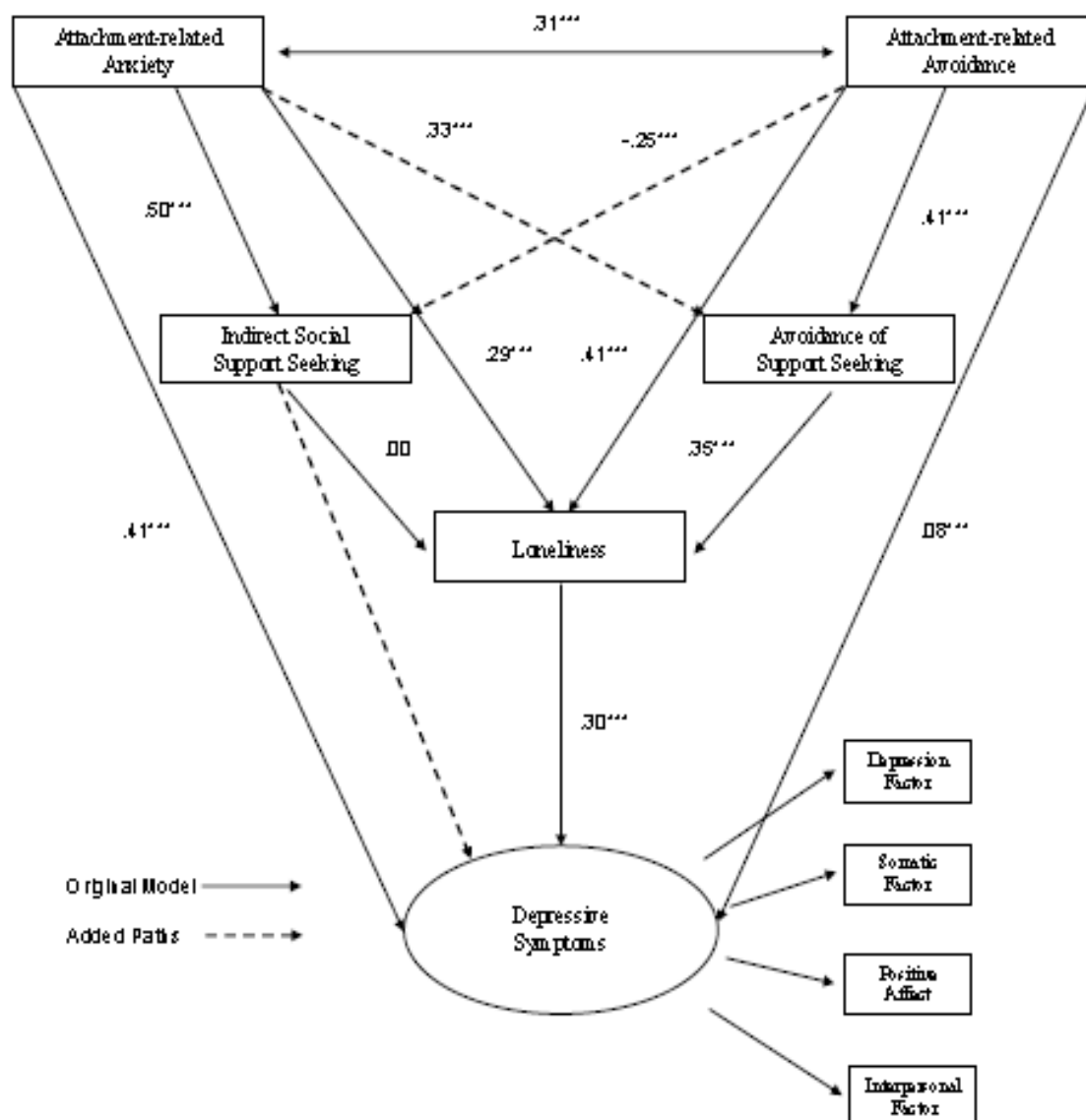
retained in the overall model. This non-significant path may be removed after replication analyses on independent samples are conducted to gain a clearer understanding whether this direct effect is in fact of negligible magnitude or not.<sup>iii</sup>

Therefore, the final structural model in the current study included the added paths from: a) avoidant attachment to indirect social support, b) anxious attachment to avoidant support seeking and c) indirect social support seeking to depressive symptoms (Figure 5).

Path analyses are one form of structural equation modeling. In path analyses, only observed variables are used (latent variables are not included). Also, error values, which are attributed to each indicator variable, are not accounted for in path analyses. Nevertheless, path analyses were also conducted to assess the overall fit of the data. In the current study, the difference between the path analyses and the structural equation analyses involves the method in which the depressive symptoms variable was measured. For the structural equation modeling analyses, depressive symptoms were represented as a latent variable with four parcels. For the path analyses, depressive symptoms were represented as a measured variable (i.e., the sum score of the depressive symptoms measure; CES – D). The findings based on the path analyses were analogous to the findings yielded from the SEM analyses (see Appendix H).

*Structural model.* In regards to the second set of analyses, meditational relationships were examined using the Maximum Likelihood method of estimation in AMOS (17.0). The steps to test mediation effects outlined by Holmbeck (1997) were used in the current study. These steps were used to evaluate whether loneliness, indirect social support seeking, and avoidance of social support seeking serve as mediators.

Figure 5.  
Final Structural Model



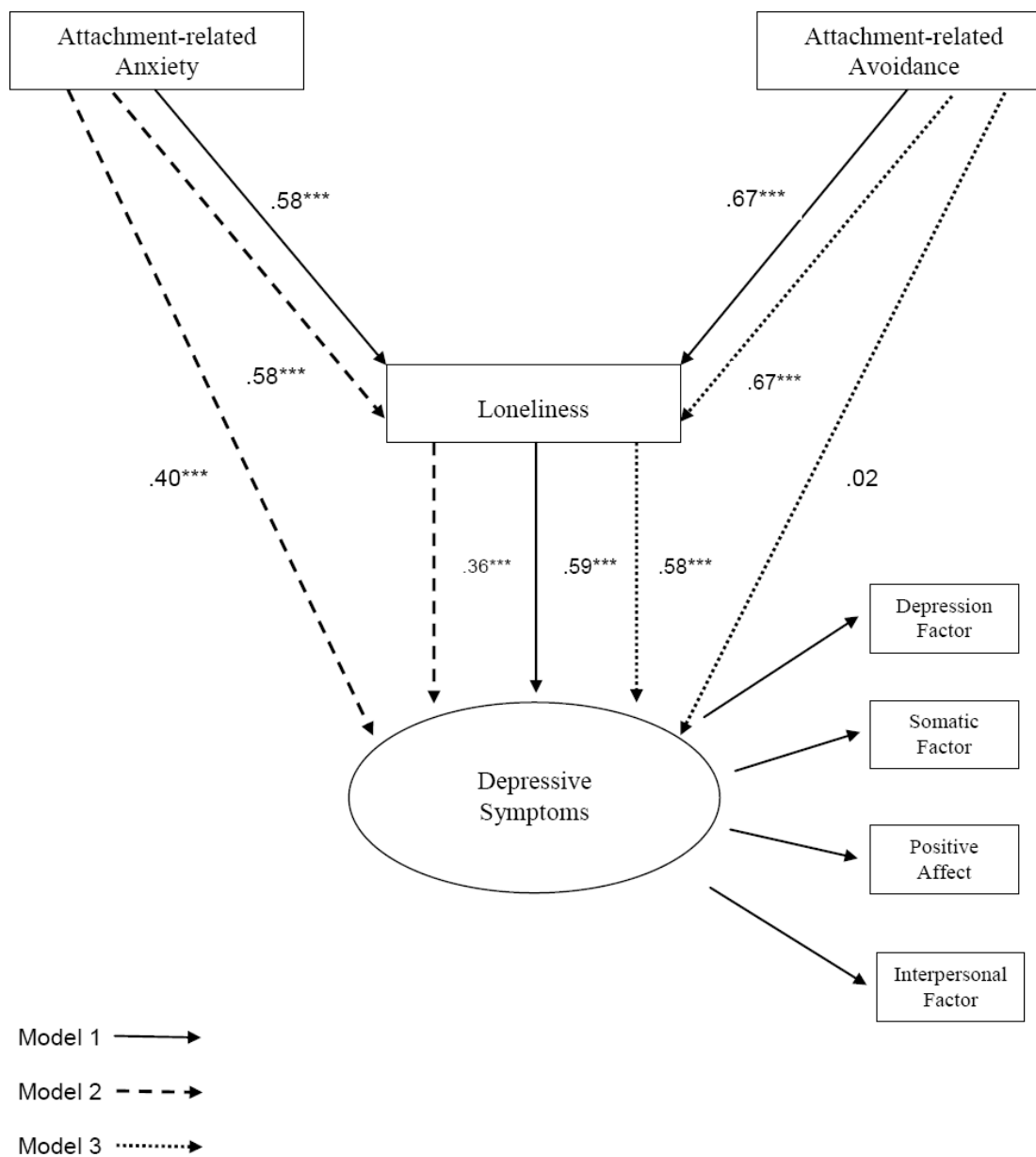
**Hypothesis 7a. Loneliness will mediate the relationship between attachment-related anxiety and depressive symptoms.** According to Holmbeck's (1997) recommendations, the first step to evaluate whether loneliness mediates the relationship between anxious attachment and depressive symptoms involves testing the direct relationship between the initial variable, anxious attachment, and the outcome variable, depressive symptoms. This ensures that an effect may in fact be mediated. In the current study, this direct relationship depicted a good fit of the data,  $\chi^2(5, N=169) = 4.18$ ,  $p=.524$ ; CFI=1.00, IFI=1.00, RMSEA=.000(90%CI: .000-.098). Anxious attachment was a significant predictor of depressive symptoms among first-year undergraduate students ( $\beta =0.61$ ,  $p=.000$ ).

The next step in assessing the mediation effects involves testing the overall model. This involves testing the direct relationship between anxious attachment and loneliness, and between loneliness and depressive symptoms. In other words, the indirect relationship between anxious attachment and depressive symptoms was assessed. This overall model showed a poor fit to the data,  $\chi^2(9, N=169) = 48.12$ ,  $p=.000$ ; CFI=.91, IFI=.91, RMSEA=.161(90%CI: .118-.207). As shown in Model 1; Figure 6, each direct relationship between attachment, loneliness, and depression was significant in the predicted direction.

The final step in assessing the mediation effects involves assessing the fit of the overall model under two conditions: when the direct path between anxious attachment and depressive symptoms is constrained to zero and when the direct path between anxious attachment and depressive symptoms is not constrained to zero (Holmbeck, 1997). Chi-square difference tests are used to assess whether the second model (not

Figure 6.

*Mediating Effects of Loneliness: Standard Regression Weights*



constrained to zero) significantly improves the fit of the first model (constrained to zero).<sup>6</sup> In the current study, the additional path between anxious attachment and depressive symptoms improves the overall fit of the data,  $\chi^2_D(1, N=169) = 23.96, p < .001$  (Model 2; Figure 6), which indicates that loneliness did not fully mediate the relationship between attachment-related anxiety and depressive symptoms. However, the effect of anxious attachment on depression is partially mediated by loneliness because the direct path coefficient from anxious attachment to depressive symptoms decreased when loneliness was added to the model ( $\beta = .61$  compared to  $\beta = .40$ ).

The indirect effect of anxious attachment on depression through loneliness can also be evaluated by the product of (a) the attachment to loneliness path coefficient and (b) the loneliness to depression path coefficient. Since the product of these two paths (.34) is smaller and of the same sign as the direct path from anxious attachment to depression, it indicates that the effect of anxious attachment on depressive symptoms is partially mediated by loneliness (Shrout & Bolger, 2002). Therefore, support was found for loneliness as a partial mediator between anxious attachment and depression.

***Hypothesis 7b. Loneliness will mediate the relationship between attachment-related avoidance and depressive symptoms.*** Once again, the steps outlined by Holmbeck (1997) were used to evaluate the mediational effect of loneliness between attachment-related avoidance and depressive symptoms. The direct relationship between avoidant attachment and depressive symptoms was assessed and revealed an adequate model fit,  $\chi^2(5, N=169) = 18.43, p = .002$ ; CFI=.96, IFI=.96, RMSEA=.126(90%CI: .068-.191) and avoidant attachment was a significant predictor of depressive symptomatology ( $\beta = .41, p = .000$ ).

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<sup>6</sup>If the direct path between the indicator and the outcome variable significantly improves the fit of the model, then complete mediation has *not* occurred.

Next, the overall meditational model between avoidant attachment, loneliness, and depressive symptoms indicated an adequate fit of the data  $\chi^2(9, N=169) = 30.04$ ,  $p=.000$ ; CFI=.95, IFI=.95, RMSEA=.118(90%CI: .073-.166). As shown in Model 1; Figure 6, each direct relationship between attachment, loneliness, and depression was significant in the predicted direction.

The final step (Model 3; Figure 6) demonstrated that the additional path between avoidant attachment and depressive symptoms did not improve the overall fit of the data,  $\chi^2_D(1, N=169) = .034$ ,  $n.s.$ , and therefore, loneliness fully mediated the relationship between attachment-related avoidance and depression. The non-significant path coefficient between avoidant attachment and depressive symptoms after loneliness was added to the model also indicates that this direct relationship is completely mediated by loneliness. Therefore, as predicted, loneliness completely mediates the relationship between avoidant attachment and depression.

***Hypothesis 8a. Indirect social support seeking behaviours (and not reluctance to seek support) will mediate the relationship between attachment-related anxiety and loneliness and subsequent depressive symptomatology.*** To test the meditational effect of indirect social support seeking between anxious attachment and loneliness and subsequent depression, first, the direct relationship between anxious attachment and loneliness was evaluated. This model was just identified (the number of free parameters were equal to the number of known values) and therefore, the chi-square significance level could not be computed,  $\chi^2(0, N=169) = .000$ . However, anxious attachment was a significant predictor of loneliness ( $\beta = 0.58$ ,  $p=.000$ ).

Next, the overall model was assessed, which involves testing the direct relationship between anxious attachment and indirect social support seeking, between

indirect support seeking and loneliness, and between loneliness and depressive symptoms. This overall model showed a poor fit to the data,  $\chi^2(14, N=169) = 133.09$ ,  $p=.000$ ; CFI=.75, IFI=.75, RMSEA=.225(90%CI: .191-.261). As shown in Model 1; Figure 7, each direct relationship between attachment, support seeking, loneliness, and depression was significant in the predicted direction.

The final step, which involves assessing the overall fit of the model under the two conditions shows that the additional path between anxious attachment and loneliness improves the overall fit of the data,  $\chi^2_D(1, N=169) = 23.96$ ,  $p<.001$ . Therefore, contrary to our hypothesis, indirect social support seeking behaviours do not mediate the relationship between attachment-related anxiety and loneliness and subsequent depressive symptoms.

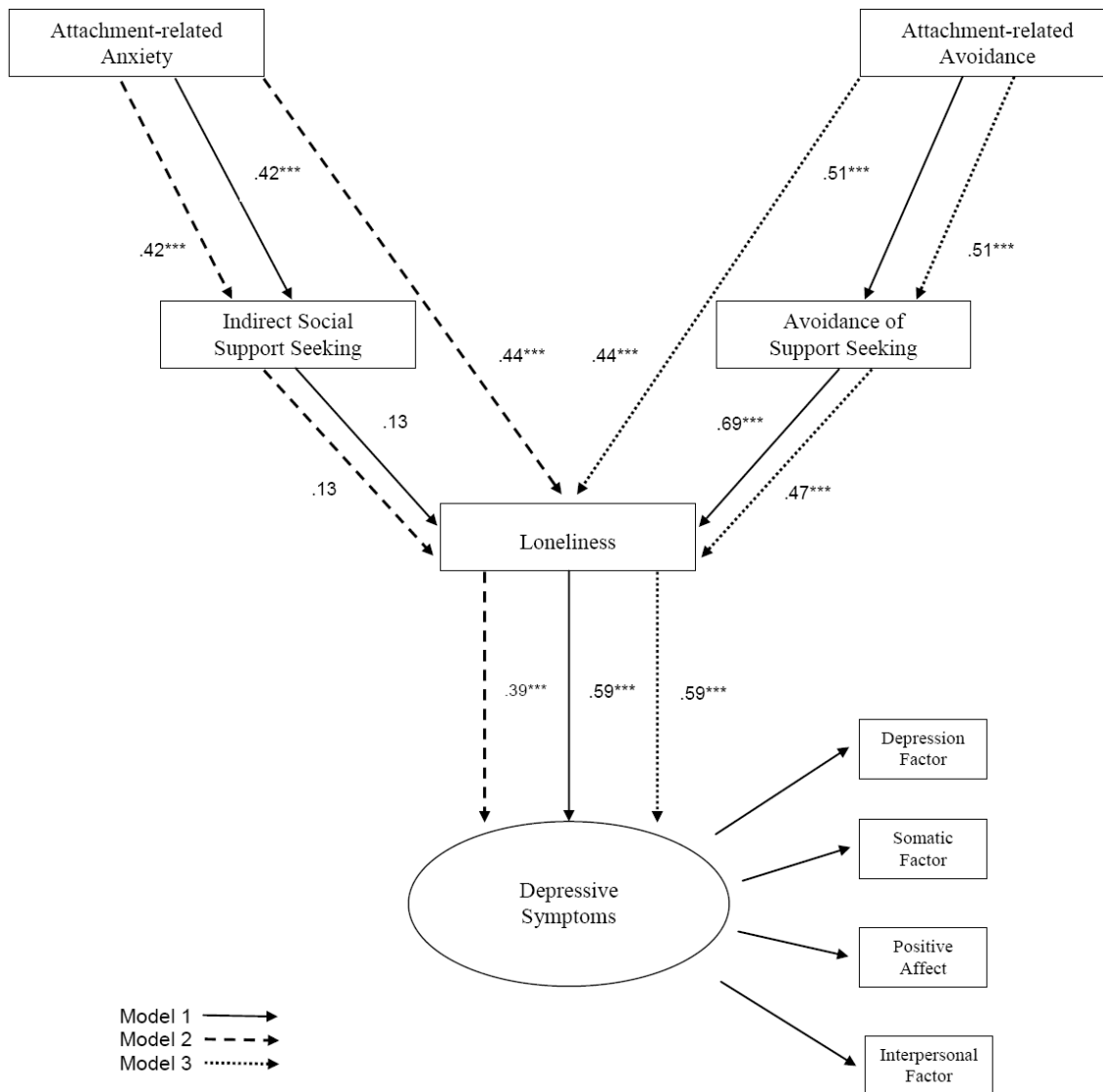
***Hypothesis 8b. Reluctance to seek social support (and not indirect support seeking behaviours) will mediate the relationship between attachment-related avoidance and loneliness and subsequent depressive symptomatology.*** The meditational effect of reluctance to seek social support between avoidant attachment and loneliness, and subsequent depressive symptoms was also tested using Holmbeck's steps. The direct relationship between avoidant attachment and loneliness was just identified and although the chi-square significance level was unable to be computed,  $\chi^2(0, N=169) = .000$ , avoidant attachment was a significant predictor of loneliness ( $\beta=.67$ ,  $p= .000$ ).

Next, the overall model between avoidant attachment, reluctance to seek support, loneliness, and depressive symptoms indicated a poor fit of the data  $\chi^2(14, N=169) = 101.33$ ,  $p=.000$ ; CFI=.84, IFI=.85, RMSEA=.193(90%CI: .158-.229). However, as shown in Model 1; Figure 7, each direct relationship between attachment, support seeking, loneliness, and depression was significant in the predicted direction.



Figure 7.

Mediating Effects of Social Support Seeking: Standardized Regression Weights



The final step (Model 3; Figure 7) demonstrated that the additional path between avoidant attachment and loneliness improved the overall fit of the data,  $\chi^2_D(1, N=169) = 51.93, p < .001$ , which indicates that reluctance to seek support did not completely mediate the relationship between attachment-related avoidance and loneliness, and subsequent depression. However, when reluctance to seek support was included in the model, the direct relationship from attachment-related avoidance to loneliness decreased from .67 to .44. Therefore, this hypothesis was supported such that avoidance of support seeking served as a partial mediator in the relationship between avoidant attachment, loneliness, and subsequent depression.

Cohen and Cohen (1983) provide a rule of thumb in determining whether the indirect effects through two or more mediators are significant. Particularly, "if all of its component unstandardized path coefficients are statistically significant at the same level of alpha, then the whole indirect effect can be taken as statistically significant at that level of alpha, too," (Kline, 2005, p. 162). In the current study, all component unstandardized path coefficients (i.e., avoidant attachment to avoidant support seeking, avoidant support seeking to loneliness, and loneliness to depression) were significant at the .001 level. Therefore, the entire indirect effect is statistically significant at the .001 level.

As shown in the final model (Figure 4), the direct path between anxious attachment and reluctance to seek support improved the overall model fit. To test the mediational effect of *reluctance* to seek social support between anxious attachment, loneliness and subsequent depressive symptoms, the same steps were conducted. Once again, anxious attachment was a significant predictor of loneliness ( $p < .001$ ). The overall model, testing the direct relationship between anxious attachment and *reluctance* to seek support, reluctance to seek support and loneliness, and loneliness and depressive symptoms revealed a poor fit to the data,  $\chi^2(14, N=169) = 96.24, p = .000$ ;

CFI=.85, IFI=.85, RMSEA=.187(90%CI: .153-.223). However, each intermediate relationship between these variables was significant ( $p<.001$ ).

The final step demonstrates that the additional path from anxious attachment to loneliness improves the fit of the data,  $\chi^2_D(1, N=169) = 30.37, p<.001$ , indicating that avoidant support seeking behaviours do not fully mediate the relationship between attachment-related anxiety and loneliness and subsequent depressive symptoms. When reluctance to seek support was included in the model, the direct path between anxious attachment and loneliness decreased from .58 to .33. Therefore, contrary to our predictions, reluctance to seek support is not a distinct mediator for attachment-related avoidance, but instead, it is a partial mediator for both attachment-related avoidance and attachment-related anxiety.

#### Ancillary Analyses: Social versus Emotional Loneliness

The objectives of the social and emotional loneliness comparison analyses were to gain a more comprehensive understanding of the relationships between a) the different types of loneliness (i.e., social and emotional) and depressive symptoms and b) the different types of loneliness and attachment-related anxiety and attachment-related avoidance. The following correlations are based on two-tailed, Pearson product-moment correlations.

*Types of loneliness and depressive symptoms.* Both emotional loneliness and social loneliness were positively correlated with depressive symptomatology, ( $r = .37, p < .001$ ) and ( $r = .46, p < .001$ ), respectively. Emotional loneliness is comprised of two subscales: Romantic Emotional Loneliness and Family Emotional Loneliness. The significant association between emotional loneliness and depressive symptoms is predominantly accounted for by the significant association between family emotional

loneliness and depressive symptoms, ( $r = .39, p < .01$ ), since romantic emotional loneliness is not significantly correlated with depressive symptoms, ( $r = .14, p > .05$ ).

*Types of loneliness and attachment.* The second goal involved evaluating whether attachment-related anxiety, compared to attachment-related avoidance, is more likely associated with emotional loneliness, and whether avoidant attachment, compared to anxious attachment, is more likely associated with social loneliness. Anxious attachment was significantly associated with both emotional loneliness, ( $r = .36, p < .01$ ) and social loneliness, ( $r = .42, p < .01$ ). Similarly, avoidant attachment was significantly associated with emotional loneliness, ( $r = .53, p < .01$ ), and social loneliness, ( $r = .51, p < .01$ ). These findings indicate that these exploratory hypotheses were not supported. Table 9 summarizes the hypotheses, statistical tests, and findings of the current study.

Table 9.

*Summary of Hypotheses, Statistical Analyses, and Findings*

<b>Hypothesis</b>	<b>Variables</b>	<b>Statistical Analysis</b>	<b>Findings</b>
<b>1. Attachment-related anxiety and attachment –related avoidance will be positively associated with depressive symptoms</b>	Attachment anxiety Attachment avoidance Depressive symptoms	Bivariate Correlational Analyses	Individuals with higher scores on attachment-related anxiety and higher scores on attachment-related avoidance reported higher levels of depressive symptoms
<b>2. Attachment-related anxiety and attachment-related avoidance will be positively associated with loneliness</b>	Attachment anxiety Attachment avoidance Loneliness	Bivariate Correlational Analyses	Individuals with higher scores on attachment-related anxiety and higher scores on attachment-related avoidance reported higher levels of loneliness
<b>3. Attachment-related anxiety will be positively associated with indirect and ineffective social support seeking behaviours</b>	Attachment anxiety Indirect support seeking	Bivariate Correlational Analyses	Individuals with higher scores on attachment-related anxiety reported greater use of indirect social support seeking behaviours
<b>4. Attachment-related avoidance will be positively associated with avoidant support seeking behaviours</b>	Attachment avoidance Avoidance of social support seeking	Bivariate Correlational Analyses	Individuals with higher scores on attachment-related avoidance reported greater reluctance to seek social support
<b>5. Indirect social support seeking and avoidant social support seeking will be positively associated with loneliness</b>	Indirect support seeking Avoidance of social support seeking Loneliness	Bivariate Correlational Analyses	Individuals who use greater indirect methods of support seeking and greater reluctance to seek support report higher levels of loneliness
<b>6. Loneliness will be positively associated with depressive symptomatology</b>	Loneliness Depressive symptomatology	Bivariate Correlational Analyses	Individuals who reported greater levels of loneliness also reported greater levels of depressive symptoms

<b>7a. Loneliness will mediate the relationship between attachment-related anxiety and depressive symptoms</b>	Attachment anxiety  Loneliness  Depressive symptoms	SEM  A <sub>anxiety</sub> → B <sub>loneliness</sub> → → C <sub>dep</sub>	Loneliness partially mediated the relationship between attachment-related anxiety and depressive symptoms
<b>7b. Loneliness will mediate the relationship between attachment-related avoidance and depressive symptoms</b>	Attachment avoidance  Loneliness  Depressive symptoms	SEM  A <sub>avoidance</sub> → B <sub>loneliness</sub> → → C <sub>dep</sub>	Loneliness completely mediated the relationship between attachment-related avoidance and depressive symptoms
<b>8a. Indirect social support seeking behaviours (and not reluctance to seek support) will mediate the relationship between attachment-related anxiety and loneliness and subsequent depressive symptomatology</b>	Attachment anxiety  Indirect social support seeking  Loneliness  Depressive symptomatology	SEM  A <sub>anxiety</sub> → B <sub>indirect</sub> → C <sub>loneliness</sub> → C <sub>dep</sub>	Indirect social support seeking behaviours did not serve as a distinct mediator between attachment-related anxiety and loneliness and subsequent depressive symptomatology. Reluctance to seek support partially mediated this relationship.
<b>8b. Reluctance to seek social support (and not indirect support seeking behaviours) will mediate the relationship between attachment-related avoidance and loneliness and subsequent depressive symptomatology</b>	Attachment avoidance  Avoidance of social support seeking  Loneliness  Depressive symptoms	SEM  A <sub>avoidance</sub> → B <sub>avoidance</sub> → C <sub>loneliness</sub> → C <sub>dep</sub>	Reluctance to seek social support partially mediated the relationship between attachment-related avoidance and loneliness and subsequent depressive symptomatology, but reluctance to seek support was not a distinct mediator

Note.

Attachment anxiety = predictor variable: A<sub>anxiety</sub>

Attachment avoidance = predictor variable: A<sub>avoidance</sub>

Indirect social support seeking behavioural tendencies = mediator: B<sub>indirect</sub>

Avoidance of social support seeking behaviours = mediator: B<sub>avoidance</sub>

Loneliness = mediator = B<sub>loneliness</sub>

Loneliness = criterion variable = C<sub>loneliness</sub>

Depressive symptoms = criterion variable = C<sub>depression</sub>

## Discussion

The purpose of the current study was to investigate hypothesized relationships between depression, attachment, social support seeking, and loneliness using Structural Equation Modeling (SEM). Particularly, the goals of the present study were (a) to examine the extent to which social support seeking mediates the relationship between insecure attachment and loneliness, and subsequent depressive symptoms and (b) to examine the mediating effects of loneliness on the relationship between insecure attachment and depressive symptoms, in a sample of first-year undergraduate students who have recently transitioned to university. The bivariate relationships between depressive symptoms, attachment orientations, support seeking strategies, and loneliness were also evaluated. Previous researchers have not evaluated the potential roles of social support seeking behaviour in mediating the relationship between adult attachment and loneliness, and subsequent depression. However, the current study applied attachment theory as a framework for understanding support seeking behaviours and the potential adverse consequences that transpire from the transition to university.

### Descriptive Data

*Female participants compared to male participants.* In the current sample, male participants were lonelier than their female counterparts. This is consistent with Perlman's (1985) review of gender differences in loneliness. He notes that although sex differences are not typically found with the UCLA Loneliness scale, when differences are revealed, males usually have higher loneliness scores.

Females in the current sample were more likely than males to seek support, regardless of type, and they were particularly likely to use emotional support, vent their emotions, and use indirect social support seeking methods (e.g., pout, sigh, or discuss their feelings with others). These differences between men and women may be

explained by the socialization hypothesis, which is based on sex role expectations. Specifically, men are socialized to use more direct and instrumental support seeking behaviours, whereas women are socialized to seek out more social support and use more emotion-focused methods of support seeking (Ptacek, Smith & Zanas, 1992; Rosario, Shinn, Morch & Huckabee, 1988). Interestingly, in the current study, females also used instrumental support seeking strategies more than males. This lends some support to Folkman and Lazarus' (1980) constraint hypothesis, which suggests that for men and women in the same roles (i.e., first-year undergraduates), gender differences based on socialization may be absent.

*Caucasian participants compared to non-Caucasian participants.* Non-Caucasian participants reported higher levels of attachment-related avoidance compared to Caucasian participants, and less use of social support seeking, emotional support seeking, emotional venting, and indirect support seeking behaviours. This was clearly a relatively crude comparison which grouped individuals from various non-Caucasian racial/ethnic backgrounds together despite their diversity. Nevertheless, it appears that, overall, non-Caucasian participants exhibit greater self-reliant tendencies and are more inclined to limit the degree to which they share their feelings or seek support from others. At minimum, this suggests that cultural factors do need to be a more explicit focus of attention when evaluating attachment and social support seeking behaviours. For example, individuals from East Asian cultures are inclined to withdraw socially and avoid seeking support when they are distressed (Frijda, Kuipers, & ter Schure, 1989).

### Correlational Analyses

*Attachment and depression.* It was predicted that attachment-related anxiety and attachment-related avoidance would both be positively associated with depressive



symptoms among first-year undergraduates, and this hypothesis was confirmed. These findings are in line with previous studies demonstrating that insecurely attached individuals are at greater risk for depression (e.g., Cotterell, 1992; Cumsille & Epstein, 1994; Field, Lang, Yando, & Bendell, 1995; Laible, Carlo, & Raffaelli, 2000).

Beck (1983) proposed that individuals with highly sociotropic styles, also referred to as anxious attachment (Bowlby, 1977), are more susceptible to life events involving interpersonal trouble and loss. Sociotropy focuses on needs for intimacy, affiliation, and dependency. Based on Beck's theory, which has acquired support in the literature (e.g., Robins & Block, 1988; Bartelstone and Trull, 1995), the interaction between personality dimensions and life events predict the onset of depressive symptoms. In line with Beck's theory, it may be that for first-year students high on attachment-related anxiety and attachment-related avoidance (personality dimension), the transition to university (life event) prompts attachment related cognitions, which predict the onset of depressive symptoms.

*Attachment and loneliness.* As hypothesized, attachment-related anxiety and attachment-related avoidance were positively related to loneliness; undergraduates who reported higher levels of anxious and/or avoidant attachment orientations also reported higher levels of loneliness. Previous researchers who have also measured attachment as two dimensions have reported similar findings (e.g., Wei, Shaffer, Young, & Zakalik, 2005). Attachment theory, which indicates that a history of rejecting, inconsistent, or unavailable attachment figures contribute to the experience of chronic loneliness (e.g. Rubenstein & Shaver, 1982; Weiss, 1974) may explain why participants high on attachment-related anxiety or attachment-related avoidance are lonelier than those who are low on these attachment dimensions.

*Attachment-related anxiety and social support seeking.* It was predicted that attachment-related anxiety would be positively associated with indirect social support

seeking behaviours. In accordance with this prediction, individuals who scored higher on attachment-related anxiety were more inclined to use indirect social support seeking strategies (e.g., pouting, sighing), compared to those who scored lower on attachment-related anxiety.

Inconsistent findings in regard to how anxiously attached individuals seek support from others have been noted in the literature and these inconsistencies may result from the tendency of anxious individuals to be preoccupied with rejection and abandonment, which interferes with their ability to directly and effectively communicate their need for support.

Although not directly hypothesized, it is worth noting that in the current study, individuals high on attachment-related anxiety reported greater avoidance of social support seeking compared to individuals low on attachment-related anxiety. Therefore, undergraduates who score high on attachment-related anxiety are inclined to avoid seeking support, however, when these students choose to seek support, they use an indirect method to do so. Consequently, anxiously attached students' method of support seeking likely contributes to a lack of support received from others and in general, a less satisfying transition to university.

*Attachment-related avoidance and social support seeking.* As predicted, individuals with higher scores on avoidant attachment were less likely to seek support from others. This finding corroborates previous reports that avoidant individuals consistently demonstrate weak inclinations to seek support, particularly at times of distress. For individuals high on attachment-related avoidance, their self-reliant, independent character, and discomfort with interpersonal closeness likely accounts for their reluctance to seek support, whereas for those high on attachment-related anxiety, their fear of rejection likely accounts for their reluctance to seek support.

Although it was not directly hypothesized, it is worth noting that individuals high on attachment-related avoidance were also less inclined to use indirect strategies, such as pouting, to seek support. Thus, as hypothesized, it appears that individuals high on attachment-related avoidance and individuals high on attachment-related anxiety use different support seeking behaviours. Those with an avoidant attachment orientation are significantly less inclined to use indirect social support seeking behaviours compared to those with an anxious attachment.

Undergraduates high on avoidant attachment may avoid using indirect strategies, such as discussing their feelings, because this behaviour promotes closeness and involves self-disclosure with others. Wei, Russell, and Zakalik (2005) found that discomfort with self-disclosure accounts for feelings of loneliness and depression among avoidantly attached first-year students. To recap, both anxiously and avoidantly attached undergraduates reported greater avoidance of social support seeking, whereas only anxiously attached students reported greater use of indirect support seeking strategies.

*Social support seeking and loneliness.* The prediction that indirect support seeking behaviours and avoidance of support seeking would be correlated with higher levels of loneliness was supported, and these findings are consistent with previous research. Nicpon et al. (2006) found that during the transition to university or college, lower levels of social support are associated with greater levels of loneliness and Riggio, Watring, and Throckmorton (1993) found that social skills and supportive social networks lessened students' perceptions of loneliness.

Lonely individuals are less socially skilled (Kalliopuska & Laitinen, 1991), less socially confident (Cheng & Furnham, 2002) and tend to display more inhibited social behaviours (Rubin, LeMare, & Lollis, 1990). The ability to directly express a need for support may reflect good social skills. Therefore, addressing insecurely attached

students' avoidant or less effective behavioural methods of support seeking, perhaps through social skills training, may help decrease the degree to which first-year students experience loneliness, and further depression.

*Loneliness and depressive symptoms.* Loneliness was expected to be associated with depression and this prediction was supported; first-year undergraduates who reported higher levels of loneliness also reported more depressive symptoms. Similarly, Scovel (1987) found that loneliness is not only associated with depression, but predicts depression. Therefore, when students report feelings of loneliness or isolation to university counsellors, the presence of depression should also be evaluated.

#### Multivariate Analyses: Structural Equation Modeling

*Mediating effects of loneliness.* It was expected that loneliness would mediate the relationship between avoidant attachment and depressive symptoms and between anxious attachment and depressive symptoms. These hypotheses were supported since the relationship between attachment-related avoidance and depressive symptoms was completely accounted for by loneliness, and the relationship between attachment-related anxiety and depressive symptoms was partially accounted for by loneliness. Thus, the depression experienced among first-year undergraduate students is largely explained by their experience of loneliness. These findings suggest that for first-year students, addressing feelings of loneliness and isolation will reduce their vulnerability to depression, which in turn, may reduce associated adverse outcomes such as drop-out, alcohol and drug abuse, and suicidal ideation.

Although ineffective social support seeking behaviours contribute to loneliness, it is also important to understand the role of loneliness as a mediator between attachment and depression. University and college counselling centres need to assess for

loneliness and take social isolation into account when assessing and treating students who present with depression.

*Mediating effects of indirect social support seeking.* It was hypothesized that indirect social support seeking behaviours would distinctly mediate the relationship between attachment-related anxiety and loneliness, and subsequent depressive symptoms among first-year undergraduate students. This hypothesis was not supported; indirect support seeking did not mediate the relationship between anxious attachment, loneliness, and depression. Instead, reluctance to seek support partially accounted for this relationship.

The finding that indirect social support seeking behaviours did not account for the relationship between anxious attachment and loneliness, and subsequent depressive symptoms, may be partly due to the method by which indirect social support seeking was measured. To date, studies that have evaluated indirect social support seeking behaviours have been observational ones (e.g., Collins & Feeney, 2000; Fraley & Shaver, 1998). Currently, a measure of indirect social support seeking is not available in the literature. The items used to assess indirect support seeking were adapted for the current study based on Barbee and Cunningham's (1995) observational coding scheme. However, as Barbee and Cunningham's (1995) coding scheme was created for observational studies, adapting these to self-report Likert scale ratings, as was done for the current study, may have negatively impacted their validity, and made them less useful measures of indirect social support.

Indirect support seeking includes behaviours such as hinting that a problem exists, sighing, or sulking to communicate emotional distress, without direct expression that help is desired. Consequently, indirect support seeking requests are met with less responsive, or even negative support (Collins and Feeney, 2000), likely because the potential support giver is unaware of the type of support needed (Barbee & Cunningham,

1995). Overall, indirect support seeking behaviours prompt less useful responses from others and create misunderstandings in social interactions. Because use of indirect strategies contributes to lower levels of received support, which contributes to loneliness, it seems reasonable and worthwhile to investigate whether indirect support seeking behaviours mediate the relationship between anxious attachment and loneliness once again.

*Mediating effects of avoidance of social support seeking.* Reluctance to seek social support was expected to distinctly mediate the relationship between attachment-related avoidance and loneliness, and subsequent depressive symptoms. This hypothesis was supported since the relationship between avoidant attachment and loneliness, and subsequent depression was partially explained by reluctance to seek support, and not explained by indirect support seeking behaviours. Therefore, the tendency for avoidant individuals to avoid support seeking helps explain why these individuals experience feelings of loneliness and depression. Addressing avoidant students' reluctant methods of seeking support will help reduce the degree to which they experience feelings of loneliness and depression during their transition to university.

Based on attachment theory, infants form expectations about the dependability of their caregiver, which translates to an orientation toward trusting others (Bowlby, 1982). Degree of trust impacts the expectation that others can be relied upon (Rotter, 1971). For undergraduates high on attachment-related avoidance in particular, their discomfort with closeness, trust, or dependency on others likely explains why they are reluctant to seek support.

#### Ancillary Analyses: Social versus Emotional Loneliness

*Types of loneliness and depressive symptoms.* Higher levels of both emotional loneliness (absence of close and connected interpersonal attachments) and social

loneliness (absence of a social network) were correlated with depression in the current study. Students who reported higher levels of family emotional loneliness also reported more depressive symptoms. However, a significant relationship between romantic emotional loneliness and depressive symptomatology was not revealed. Given that the current sample was comprised of predominantly single, late adolescent participants, it seems reasonable that a loss of connectedness with family members, compared to romantic partners, was more closely associated with depression. In addition, the transition to university, which is believed to activate the attachment system and trigger action tendencies related to seeking contact with an attachment figure, may explain why the association between family emotional loneliness and depression is more pronounced than the relationship between romantic emotional loneliness and depression.

*Types of loneliness and attachment.* The exploratory predictions that attachment-related anxiety would be more likely associated with emotional loneliness than attachment-related avoidance, and that attachment-related avoidance would be more closely associated with social loneliness than attachment-related anxiety were not supported. Undergraduates high on attachment-related anxiety experienced greater degrees of emotional and social loneliness and students high on attachment-related avoidance also experienced more social and emotional loneliness. Insecurely attached students may have experienced heightened levels of both social and emotional loneliness during the transition to university because at this stage, both the absence of close relationships and the absence of a social network may be salient factors impacting their sense of loneliness.

#### Importance of the Current Study

Secure attachment is believed to promote current and future adaptive behaviour (Waters & Sroufe, 1983), including adaptive behaviour during the transition to college.

In regards to help seeking specifically, Lopez, Melendez, Sauer, Berger, and Wyssmann (1998) reported that avoidantly-attached undergraduates experience greater difficulty achieving high grades compared to securely attached individuals because of their inability to ask for help. In general, academic experiences and psychological well-being appear to be more promising for securely attached students, and for this reason, it is beneficial to investigate the factors that contribute to the less satisfying transition to university among insecurely attached students. Gaining a better understanding of why students high on attachment-related anxiety and attachment-related avoidance are more vulnerable to loneliness and depression may improve their academic achievement and their overall university experience.

Students are particularly vulnerable during the transition to university because they are likely to be away from home for their first time, to be removed from their familiar social networks and environment, and to be uncertain about how to meet social and academic expectations in a new environment. The current findings suggest that preventative and intervention programs need to address loneliness and depression among first-year students undergoing the transition to university, and that an attachment theory framework may be useful in guiding treatment. For instance, short-term therapeutic modalities, such as emotion-focused therapy and interpersonal therapy may be employed to treat depression among first-year students.

For undergraduates high on attachment-related anxiety or attachment-related avoidance, the tendency to avoid seeking support at times of need should be a direct focus of treatment. Addressing the reluctance to seek support should reduce the degree to which students experience loneliness and depression. Increasing the degree to which formal and informal methods of support are available for first-year students may be one method to compensate for students' reluctance to seek support. Particularly, since insecurely attached students are hesitant to seek out support, it is imperative that



support and resources are readily available and provided to the students from the onset of their post-secondary education. For instance, colleges and universities could implement mandatory student led orientations, where first-year students will be afforded the opportunity to meet upper year students, form social networks, and become familiar with and join social and academic organizations. In order to better facilitate the availability of support for students, department wide or discipline specific orientations should be available, at the very least, over the course of the fall academic semester, rather than limited to an “orientation week.” Particularly for students who are reluctant to seek social support, repeatedly scheduled orientations may provide them with support, which in turn, may help address feelings of loneliness and depression. Organizations that provide peer support and aid students with academic and general university inquiries ought to be available. Such organizations should be informal in regards to having an open door policy, which promotes a welcoming, nonthreatening ambiance. This type of environment may reduce students’ impression that they are seeking support and increase the likelihood of utilizing such services. Furthermore, using cognitive behavioural strategies to attend to the cognitions related to asking others for help may be another area of focus when addressing the concerns of first-year students. Social skills training and role playing exercises, which promote direct support seeking behaviours may ultimately improve first-year students’ overall satisfaction with the transition to university. Specifically, if insecurely attached students feel less lonely and less depressed, their transition to university will presumably be a more positive one.

University counsellors who implement intervention programs aimed at addressing adjustment issues experienced by first-year students should also take into account how loneliness contributes to depression among anxiously- and avoidantly-attached individuals. When students report symptoms of depression, rather than attempting to alter their attachment orientation, which is for the most part, a long-standing, stable

construct, feelings of loneliness can be addressed instead. Recurring orientations may also address feelings of loneliness, specifically, lack of companionship, detachment from a group of friends, and isolation.

### Limitations

The present study is cross-sectional in nature. The degree to which the findings are independent of depression levels prior to the transition to university was not evaluated. It is possible that students high on anxious and avoidant attachment were more depressed prior to the onset of university, in which case, their higher levels of depression during the current study are not necessarily accounted for by social support seeking behaviours and loneliness.

Although the current sample size was sufficient, a larger sample size may have provided more stable findings with greater statistical power. Additionally, the current sample was comprised of first-year, predominantly Caucasian students. Therefore, the results are not generalizable to upper year or minority students. For first-year students, the separation from a familiar home and academic environment and the separation from family and friends spark attachment related cognitions and behaviours. These attachment related cognitions influence the method in which students seek support, which in turn, are predictive of loneliness and depression. However, for upper year students and for students from non-Caucasian racial and ethnic backgrounds, other factors, such as academic achievement or family and cultural variables, may be more salient in accounting for their heightened levels of depression.

A psychometrically sound questionnaire for assessment of indirect social support seeking behaviour does not exist in the literature, and the validity of the measure used to assess indirect social support seeking behaviour in the current study was not previously evaluated.

### Future Research

Development of a psychometrically sound inventory to assess indirect social support behaviours is long overdue. Future researchers may choose to assess social support seeking behaviours using a method other than Likert scale questionnaires. For example, participants could be presented with a brief scenario and from a set of alternatives, be required to select one behavioural response that they would engage. The available responses for each scenario would represent direct support seeking behaviours, indirect support seeking behaviours, and avoidant support seeking behaviours. Students could also be provided with a scenario, followed by one behavioural response, and required to indicate whether they would respond in that particular manner or not.

It would also be interesting for future researchers to take into account the attachment orientation of the potential support giver as well as the attachment orientation of the support seeker. Evaluating the interaction between the support provider and the support recipient, referred to as the “transactional perspective,” may be one focus of investigation (Gottlieb, 1985). The transactional perspective is a multifaceted paradigm which focuses on the dyad between the support seeker and support provider, the skills involved for each member, and situational, individual, and relationship factors of each member (Berman, 2004). Berman (2004) explains that the social interaction between the support seeker and the support giver may account for why some individuals are reluctant in seeking or accepting support and why support providers respond hesitantly in initiating or complying with requests.

Future researchers could also aim to test the explanatory model used in the current study using a more ethnically diverse sample. Comparisons between the support seeking strategies employed across different racial groups may be included in a

prospective study in order to gain a better understanding of the racial generalizability of this model.

In closing, insecurely attached students are more susceptible to poorer psychological well-being during the transition to university; however, awareness of the support seeking strategies used by insecurely attached undergraduates is a distinct area of focus when applying intervention techniques. Thus, when aiming to reduce feelings of loneliness and depression among first-year undergraduates, initially gaining an understanding of their interpersonal and attachment orientation is one promising approach to treatment.

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## Appendix A

## Psychology Participant Pool Description

- **Title:** Interpersonal Styles and Behavioural Tendencies among First Year Undergraduate Students
- **Abstract:** If you volunteer to participate in this study, you will complete a number of questionnaires that inquire about your interpersonal relationships, feelings, and behavioural tendencies.
- **Description:** The purpose of this study is to evaluate the behavioural tendencies that relate to successful transitions to university among first year students.
- **Duration:** 35 to 45 minutes
- **Points:** 1 point
- **Testing dates:** To be determined
- **Restrictions:** First-year students only

## Appendix B

## Hazan and Shaver's (1987) Three Attachment Statements

*A. I am somewhat uncomfortable being close to others; I find it difficult to trust them completely, difficult to allow myself to depend on them. I am nervous when anyone gets too close, and often, others want me to be more intimate than I feel comfortable being.*

*B. I find it relatively easy to get close to others and am comfortable depending on them and having them depend on me. I don't worry about being abandoned or about someone getting too close to me.*

*C. I find that others are reluctant to get as close as I would like. I often worry that my partner doesn't really love me or won't want to stay with me. I want to get very close to my partner, and this sometimes scares people away.*

## Appendix C

## Email for Potential Participants

Hello,

My name is Anna Arcuri and I am currently conducting a research study within the Department of Psychology at the University of Windsor. This study has been reviewed and approved by the Research Ethics Board (REB) at the University of Windsor. The study is entitled, *Interpersonal Styles and Behavioural Tendencies among First Year Undergraduate Students* and the purpose of this study is to evaluate the behavioural tendencies that relate to successful transitions to university. If you volunteer to participate in this study, you will complete questionnaires that inquire about your interpersonal relationships, feelings, and behavioural tendencies. The total length of time for participation is approximately 35 minutes and you will receive 1 bonus credit for your participation. You are receiving this message because I realized that you are eligible to participate in this study, however, you are not obligated to do so. If you would like to participate, please log in to the Psychology Department Research Participant Pool System at <http://uwindsor.sona-systems.com/> and register for a date. If you are unable to view this study, please feel free to email me with your preferred date and time, and I will add you. I will send you a confirmation email with the date and time. If you have already registered for this study, please ignore this notice.

Timeslots:

Available timeslots were included.

If you have any questions or concerns, please feel free to contact me at [arcuri@uwindsor.ca](mailto:arcuri@uwindsor.ca).

Thank you for your time,

Anna

Anna Arcuri, B.Sc. (Hons.)  
M.A. Candidate, Adult Clinical Psychology  
University of Windsor

## Appendix D

**CONSENT TO PARTICIPATE IN RESEARCH**

Title of Study: **Interpersonal Styles and Behavioural Tendencies among First Year Undergraduate Students.**

You are asked to participate in a research study within the Department of Psychology at the University of Windsor. This study is being conducted by Anna Arcuri under the supervision of Dr. Cheryl D. Thomas, in partial fulfilment of the requirements for the M.A. degree. This study has been reviewed and approved by the Research Ethics Board (REB) at the University of Windsor.

If you have any questions or concerns about the research, please feel free to contact:

- **Anna Arcuri** at [arcuri@uwindsor.ca](mailto:arcuri@uwindsor.ca)
- **Dr. Cheryl D. Thomas** at 519-253-3000 Ext. 2252 or at [cdthomas@uwindsor.ca](mailto:cdthomas@uwindsor.ca)
- **Dr. Sandra Paivio** at 519-253-3000 Ext. 2232 or at [paivio@uwindsor.ca](mailto:paivio@uwindsor.ca)

**PURPOSE OF THE STUDY**

The purpose of this study is to evaluate the behavioural tendencies that relate to successful transitions to university among first year students.

**PROCEDURES**

If you volunteer to participate in this study, you will complete a number of questionnaires that inquire about your interpersonal relationships, feelings, and behavioural tendencies. The total length of time for participation is approximately 35 to 45 minutes.

**POTENTIAL RISKS AND DISCOMFORTS**

There are no known or expected physical, psychological, emotional, financial, or social risks associated with participating in this study. However, some questions inquire about interpersonal relationships and experiences that some people may find mildly distressing. You are free to withdraw from the study at any point, if you wish. If you do experience mild distress, free services for students are available on campus at:

**Student Counselling Centre**

Location: Room 293 on the 2<sup>nd</sup> floor of the CAW Student Centre

Phone Number: (519) 253 3000 Ext. 4616

General Inquires: [scc@uwindsor.ca](mailto:scc@uwindsor.ca)

Services are also available off campus for youth up to 24 years of age at:

**Teen Health Centre**

Location: 1585 Ouellette Ave.

Phone Number: (519) 253-8481

General Inquires: [teenhealthcentre.com](http://teenhealthcentre.com)

**POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY**

The information gathered may further the understanding of the factors related to the transition to university among first year undergraduates. Findings may contribute to the development of intervention programs for undergraduate students.

**COMPENSATION FOR PARTICIPATION**

You may be eligible to receive 1 bonus credit for classes involved with the Psychology Research Participant Pool. There is no financial compensation for participation in this research.

**CONFIDENTIALITY**

Any information that you provide in connection with this study that could identify you will remain confidential and will be disclosed only with your permission. Each questionnaire package is assigned a research identification number and separated from the consent form to ensure that confidentiality of the data is maintained. Only summaries of group data are released; individual responses are not reported. Ethical research practice requires that questionnaires be kept in a secure storage location for five years subsequent to the completion of the study.

**PARTICIPATION AND WITHDRAWAL**

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study. You do have the option of removing the data from the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

**FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS**

A summary of the results of this study can be accessed on the University of Windsor, Research Ethics Board site (<http://uwindsor.ca/reb>) in September 2009.

**SUBSEQUENT USE OF DATA**

This data will be used in subsequent studies.

## RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. If you have questions regarding your rights as a research subject, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: [ethics@uwindsor.ca](mailto:ethics@uwindsor.ca)

## SIGNATURE OF RESEARCH SUBJECT/LEGAL REPRESENTATIVE

I understand the information provided for the study **Interpersonal Styles and Behavioural Tendencies among First Year Undergraduate Students** as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

\_\_\_\_\_  
Name of Subject

\_\_\_\_\_  
Signature of Subject

\_\_\_\_\_  
Date

## SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

\_\_\_\_\_  
Signature of Investigator

\_\_\_\_\_  
Date



## Appendix E



## LETTER OF INFORMATION FOR CONSENT TO PARTICIPATE IN RESEARCH

Title of Study: **Interpersonal Styles and Behavioural Tendencies among First Year Undergraduate Students.**

You are asked to participate in a research study within the Department of Psychology at the University of Windsor. This study is being conducted by Anna Arcuri under the supervision of Dr. Cheryl D. Thomas, in partial fulfilment of the requirements for the M.A. degree. This study has been reviewed and approved by the Research Ethics Board (REB) at the University of Windsor.

If you have any questions or concerns about the research, please feel free to contact:

- **Anna Arcuri** at [arcuri@uwindsor.ca](mailto:arcuri@uwindsor.ca)
- **Dr. Cheryl D. Thomas** at 519-253-3000 Ext. 2252 or at [cdthomas@uwindsor.ca](mailto:cdthomas@uwindsor.ca)
- **Dr. Sandra Paivio** at 519-253-3000 Ext. 2232 or at [paivio@uwindsor.ca](mailto:paivio@uwindsor.ca)

### PURPOSE OF THE STUDY

The purpose of this study is to evaluate the behavioural tendencies that relate to successful transitions to university among first year students.

### PROCEDURES

If you volunteer to participate in this study, you will complete a number of questionnaires that inquire about your interpersonal relationships, feelings, and behavioural tendencies. The total length of time for participation is approximately 35 to 45 minutes.

### POTENTIAL RISKS AND DISCOMFORTS

There are no known or expected physical, psychological, emotional, financial, or social risks associated with participating in this study. However, some questions inquire about interpersonal relationships and experiences that some people may find mildly distressing. You are free to withdraw from the study at any point, if you wish. If you do experience mild distress, free services for students are available on campus at:

#### **Student Counselling Centre**

Location: Room 293 on the 2<sup>nd</sup> floor of the CAW Student Centre

Phone Number: (519) 253 3000 Ext. 4616

General Inquires: [scc@uwindsor.ca](mailto:scc@uwindsor.ca)

Services are also available off campus for youth up to 24 years of age at:

**Teen Health Centre**

Location: 1585 Ouellette Ave.

Phone Number: (519) 253-8481

General Inquires: [teenhealthcentre.com](http://teenhealthcentre.com)

**POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY**

The information gathered may further the understanding of the factors related to the transition to university among first year undergraduates. Findings may contribute to the development of intervention programs for undergraduate students.

**COMPENSATION FOR PARTICIPATION**

You may be eligible to receive 1 bonus credit for classes involved with the Psychology Research Participant Pool. There is no financial compensation for participation in this research.

**CONFIDENTIALITY**

Any information that you provide in connection with this study that could identify you will remain confidential and will be disclosed only with your permission. Each questionnaire package is assigned a research identification number and separated from the consent form to ensure that confidentiality of the data is maintained. Only summaries of group data are released; individual responses are not reported. Ethical research practice requires that questionnaires be kept in a secure storage location for five years subsequent to the completion of the study.

**PARTICIPATION AND WITHDRAWAL**

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study. You do have the option of removing the data from the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

**FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS**

A summary of the results of this study can be accessed on the University of Windsor, Research Ethics Board site (<http://uwindsor.ca/reb>) in September 2009.

**SUBSEQUENT USE OF DATA**

This data will be used in subsequent studies.

## RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. If you have questions regarding your rights as a research subject, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: [ethics@uwindsor.ca](mailto:ethics@uwindsor.ca)

## SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

---

Signature of Investigator

---

Date

RID:

## Appendix F

## Demographic Questionnaire

1. Your Age: \_\_\_\_\_
2. Sex:  Male  Female
3. Year of Study: \_\_\_\_\_
4. Are you:
  - Single
  - Involved in a romantic relationship If yes, for how long? \_\_\_\_\_
  - Married
5. Do you consider yourself to be (please check one):
  - Heterosexual
  - Homosexual
  - Bisexual
  - Other
6. Check the box that shows how you identify yourself by race.
  - Aboriginal (North American Indian, Métis or Inuit (Eskimo))
  - Black
  - Chinese
  - Filipino
  - Japanese
  - Korean
  - Latin American
  - South Asian (e.g., Vietnamese, Cambodian, Malaysian, Laotian, etc.)
  - West Asian (e.g., Iranian, Afghan, etc.)
  - White
  - Mixed (please specify): \_\_\_\_\_
  - Other (please specify): \_\_\_\_\_
7. Who do you live with right now? (check one)
 

<input type="checkbox"/> Alone	<input type="checkbox"/> Romantic partner How long? _____
<input type="checkbox"/> Both natural parents	<input type="checkbox"/> Roommate How many? ___ How long? ___
<input type="checkbox"/> My mother only	<input type="checkbox"/> Husband / Wife How long? _____
<input type="checkbox"/> My father only	<input type="checkbox"/> Common law partner How long? _____
<input type="checkbox"/> Parent 1 & Parent 2 Please specify (e.g., mother & step-father): _____	
<input type="checkbox"/> Other (please specify): _____	
8. Do you live away from home (e.g., live away from your parents, family)?  Yes  No  
 If yes, is this your first time living away from home  Yes  No

RID:

9. Do you live away from your hometown?  Yes  No  
 If yes, is this your first time living away from home?  Yes  No  
 What is your hometown? \_\_\_\_\_  
 How far away is your hometown? \_\_\_\_\_ (in kilometres)  
 How long has it been since you moved away from home? \_\_\_\_\_  
 How often do you intend to return to your hometown? \_\_\_\_\_
10. Are your natural parents divorced or separated?  Yes  No  
 If yes, how long have they been apart? \_\_\_\_\_ (years)  
 If yes, and you only live with one natural parent, how often do you spend time with or talk to the parent that you DO NOT live with (check one):
- a few times a week or more  about 1 time every 3 months  
 about once a week  about 2 times every year  
 about 1 – 2 times a month  about once a year or less

11. Please check the box that shows the highest level of education completed by your parents.

Please Specify (e.g., mother)	Parent 1	Parent 2	Step Parent 1	Step Parent 2
Grade 8 or less	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Some high school, but did not graduate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Graduated from high school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Graduated from community or technical college	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Graduated from university	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Obtained a post graduate or professional degree (e.g., M.A., Ph.D., M.D., LLB etc.,)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Don't know	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	_____	_____	_____	_____

Thank you.

## Appendix G

## Support Seeking Items constructed for the Current Study

We are interested in how people respond when they confront difficult or stressful events in their lives. There are lots of ways to try to deal with stress. This questionnaire asks you to indicate what you generally do and feel, when you experience stressful events. Obviously, different events bring out somewhat different responses, but think about what you usually do when you are under a lot of stress.

Then respond to each of the following items by writing a number for each statement, using the response choices listed just below. Please try to respond to each item separately in your mind from each other item. Choose your answers thoughtfully, and make your answers as true FOR YOU as you can. Please answer every item. There are no "right" or "wrong" answers, so choose the most accurate answer for YOU--not what you think "most people" would say or do. Indicate what YOU usually do when YOU experience a stressful event.

- 1 = I usually don't do this at all
- 2 = I usually do this a little bit
- 3 = I usually do this a medium amount
- 4 = I usually do this a lot

- \_\_\_\_\_ 1. I complain about the situation, without requesting help from others.
- \_\_\_\_\_ 8. I fidget when I am with someone.
- \_\_\_\_\_ 13. I sigh when I am with someone.
- \_\_\_\_\_ 17. I sulk when I am with someone (e.g., mope and feel sorry for yourself in front of others).
- \_\_\_\_\_ 19. I ask others for help.
- \_\_\_\_\_ 20. I hint to others that a problem exists.

## Appendix H

## Additional Statistics and Explanatory Notes

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<sup>i</sup> *Structural Equation Modeling: Measurement Model.* In the first set of analyses, the measurement model was assessed. Measurement models assess how well the indicator variables or parcels measure the latent construct. The direct path from the latent variables to an indicator variable is called a factor loading. These loadings, which are generally interpreted as regression coefficients, represent the causal effect of the latent variable on the observed scores (parcels) (Kline, 2005). In order to ensure model identification, one factor loading from the latent variable to one of its indicator variables was fixed to the value one. Constraining one direct path per latent variable (factor) reduces the number of free parameters by one for each factor. A measurement model also assesses the correlations among the latent variables.

<sup>ii</sup> *Model Fit Criteria.* The chi-square statistic is one method of assessing whether the model fits the data. However, because the chi-square statistic computed by AMOS is sensitive to sample size and to deviations from multivariate normality, typically it is not the only index in determining the overall fit of the model. Thus, additional goodness of fit indices that were evaluated in the current study include the comparative fit index (CFI), Bollen's incremental fit index (IFI), and the root mean square of approximation (RMSEA). The CFI measures the fit of the proposed model relative to the independence model and assumes there is no relationship in the data (Weston & Gore, 2006). The RMSEA value indicates the average of the residuals between the observed correlation/covariance from the sample and the expected model estimated for the population (Weston & Gore, 2006). RMSEA is a badness of fit index and therefore indicates whether the model is a

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poor fit. Although RMSEA values also range from zero to one, unlike the previous indices, higher values suggest poor model fit (Kline, 2005).

A model is hierarchical, or nested, if it shares the same data and variables with another model, but it is a subset of it. For instance, if a direct path between variables is removed from an original model, the “new” model is a nested model. Chi-square difference tests are used to test nested model comparisons. If the difference between the chi-square statistic of the larger model and the nested model is significant, this lends support that the more complex model fits the data better than the nested one.

In the current study, some nested model comparisons were based on the Modification Indices (MI) provided by AMOS 17.0 were evaluated to achieve better fit. Modification Indices estimate the degree to which the chi-square statistic would decrease if the recommended path was added to the model. It is important that any changes based on the Modification Indices make theoretical sense and are not solely based on empirical criteria such as statistical significance.

<sup>iii</sup> *Non-significant Paths.* Loehlin (1998) states that the removal of every non-significant path is not necessary, particularly when the sample size is not large or the power is low. Loehlin suggests that non-significant paths are retained in the model until replication analyses on independent samples also indicate a non-significant association among the variables. When changes to improve model fit are based on empirical reasoning, such as modification indices, the analyses become exploratory in nature. In other words, changes are based on the current data set, and the overall model need to be tested on an independent sample to provide corroborating support for the overall model. Given that the final model in the current study includes changes based on modification indices, it is exploratory in nature.



*Path Analyses.* The following results are based on the findings from the path analyses. The path analyses were also conducted using AMOS 17.0 (Arbuckle, 2009). The same sequence of steps that were followed for the structural equation modeling analyses were used in these analyses. These results were compared to those revealed from the SEM analyses.

*Measurement Model.* The original hypothesized model was tested and depicted a poor fit to the data,  $\chi^2(5, N=169) = 48.629, p < .001$ ; CFI=.89, IFI=.90, RMSEA=.228(90%CI:.172-.288). Two nested model comparisons were performed in order to determine whether indirect social support seeking behaviours and avoidance of support seeking served as distinct mediators. To evaluate whether indirect support seeking served as a distinct mediator for attachment-related anxiety, the direct path from attachment-related avoidance to indirect social support seeking was added to the original model. This added path also resulted in a poor fit to the data,  $\chi^2(4, N=169) = 36.687, p < .001$ ; CFI=.92, IFI=.92, RMSEA=.221(90%CI:.159-.288). A chi-square difference test comparing the original model outlined and this alternative model revealed a significant chi-square difference,  $\chi^2_D(1, N=169) = 11.94, p < .001$ . Similar to the findings of the SEM analyses, this suggests that the added path from attachment-avoidance to indirect support seeking should be retained because this model fits the data better. Once again, the correlation between avoidant attachment and indirect support seeking is a negative one. Therefore, although this added path improves the overall fit of the model, it indicates that avoidant attachment is negatively predictive of indirect support seeking. Based on the association between avoidant attachment and indirect support seeking, indirect support seeking does not mediate the relationship between avoidant attachment and loneliness, and subsequent depression.

The next alternative model was tested to determine whether reluctance to seek support served as a distinct mediator for attachment-related avoidance. A direct path from attachment-related anxiety to reluctance to seek support was added to the original model. This (second) alternative model also depicted a fair fit of the data,  $\chi^2(4, N=169) = 24.52, p < .001$ ; CFI=.95, IFI=.95, RMSEA=.175(90%CI:.112-.244). A significant chi-square difference test,  $\chi^2_D(1, N=169) = 24.11, p < .001$  suggests that adding this path improves the fit of the original model and this path should be retained. In line with the SEM analyses, this alternative model indicates that avoidance of support seeking does not serve as distinct mediator for avoidant attachment.

Based on the findings that the two alternative models outlined above improve the model fit, these paths (i.e., a direct path from avoidant attachment to indirect support seeking and a direct path from anxious attachment to avoidant support seeking), were added to the original model. The new model, resulted in an adequate fit of the data,  $\chi^2(3, N=169) = 12.58, p < .01$ ; CFI=.98, IFI=.98, RMSEA=.138(90%CI:.065-.221). The statistically significant chi-square difference test,  $\chi^2_D(2, N=169) = 36.05, p < .001$ , supports the finding that the two added paths fits the data better compared to the original model. This finding is analogous to the finding revealed by the SEM analyses.

Like the SEM analyses, the modification indices indicate that a direct path between indirect social support seeking and depressive symptoms would improve the overall model fit. When this direct path was added to the model, it indicated a good fit to the data,  $\chi^2(2, N=169) = 3.15, p > .05$ ; CFI=.997, IFI=.997, RMSEA=.059(90%CI:.000-.175). When this path is added to the model, a significant chi-square difference statistic,  $\chi^2_D(1, N=184) = 9.43, p < .01$  is revealed which suggests that this added path improves the overall fit of the model. Although these finding are in line with the findings from the SEM analyses, for the path analyses, the added path from indirect social support

seeking to depressive symptoms improves the model at  $p < .01$ , not  $p < .001$ . Therefore, like the SEM analyses, the final model based on the path analyses included the added paths from: a) avoidant attachment to indirect social support, b) anxious attachment to avoidant support seeking and c) indirect social support seeking to depressive symptoms.

The non-significant path from indirect social support to loneliness was present in the model and this path was removed to evaluate whether the model fit would be improved. Similar to the finding in the SEM analyses, the removal of the non-significant path between indirect social support and loneliness did not improve the overall fit of the model as indicated by the non-significant chi-square difference test,  $\chi^2_D(1, N=169) = .003, n.s.$  However, the removal of this non-significant path improves the RMSEA value, indicating a good model fit,  $\chi^2(3, N=169) = 3.15, p > .05$ ; CFI=1.00, IFI=1.00, RMSEA=.017(90%CI:.000-.132). Based on the findings that the more parsimonious model (with the path between indirect social support to loneliness removed) provides a better fit of the data, this model would typically be retained as the final model. However, because these are exploratory analyses, this direct path will currently be retained in the overall model. Confirmatory analyses are necessary in order to assert whether this relationship is in fact negligible or not.

*Structural Model.* A second set of analyses were conducted with using the path analyses as well. In these analyses, the meditational effects of social support seeking behaviours were examined using the maximum likelihood method of estimation in path analyses. Holmbeck's (1997) steps to assess mediation were used.

***Hypothesis 7a. Loneliness will mediate the relationship between attachment-related anxiety and depressive symptoms.***

***Hypothesis 7b. Loneliness will mediate the relationship between attachment-related avoidance and depressive symptoms.*** The hypotheses related to

whether loneliness served as a mediator between insecure attachment orientations (i.e., attachment-related anxiety and attachment-related avoidance) and depressive symptoms were not conducted using path analyses because when the direct path between attachment and depression is added to the model, it became just identified. In other words, the number of unknowns (i.e., parameters that must be estimated) are equal to the number of knowns (typically, variances and covariances). When a model is just identified, the chi-square probability value and some model fit indices (RMSEA) cannot be computed.

***Hypothesis 8a. Indirect social support seeking behaviours (and not reluctance to seek support) will mediate the relationship between attachment-related anxiety and loneliness and subsequent depressive symptomatology.***

Holmbeck's (1997) steps were used to test the mediational effect of indirect social support seeking between anxious attachment and loneliness and subsequent depression. For the first step, the direct relationship between anxious attachment and loneliness was evaluated. Anxious attachment was a significant predictor of loneliness ( $\beta=0.58, p=.000$ ).

Next, the overall model was assessed, which involves testing the direct relationship between anxious attachment and indirect social support seeking, between indirect support seeking and loneliness, and between loneliness and depressive symptoms. This overall model showed a poor fit to the data,  $\chi^2(3, N=169) = 99.62, p=.000$ ; CFI=.49, IFI=.50, RMSEA=.438(90%CI: .366-.514). However, the direct relationship between indirect social support seeking and loneliness was non-significant ( $p > .05$ ).

Nevertheless, the final step, which involves assessing the overall fit of the model when it is constrained to zero and when it is not constrained was conducted and

revealed that the additional path between anxious attachment and loneliness improves the overall fit of the data,  $\chi^2_D(1, N=169) = 68.71, p < .001$ . In line with the findings revealed with the SEM analyses, this indicates that indirect social support seeking behaviours do not mediate the relationship between attachment-related anxiety and loneliness and subsequent depressive symptoms.

***Hypothesis 8b. Reluctance to seek social support (and not indirect support seeking behaviours) will mediate the relationship between attachment-related avoidance and loneliness and subsequent depressive symptomatology.*** The meditational effect of reluctance to seek social support between avoidant attachment and loneliness, and subsequent depressive symptoms was tested using the steps outlined in the previous analyses. Avoidant attachment was a significant predictor of loneliness ( $\beta=.67, p=.000$ ).

Next, the overall meditational model between avoidant attachment, reluctance to seek support, loneliness, and depressive symptoms indicated a poor fit of the data  $\chi^2(3, N=169) = 56.63, p=.000$ ; CFI=.80, IFI=.80, RMSEA=.326(90%CI: .255-.403). Each direct relationship between attachment, support seeking, loneliness, and depression was significant in the predicted direction, ( $p < .000$ ).

The final step demonstrated that the additional path between avoidant attachment and loneliness indicated an adequate model fit, data  $\chi^2(2, N=169) = 4.70, p > .05$ ; CFI=.99, IFI=.99, RMSEA=.090(90%CI: .000-.198), and improved the overall fit,  $\chi^2_D(1, N=169) = 51.93, p < .001$ . Therefore, reluctance to seek support did not completely mediate the relationship between attachment-related avoidance and loneliness, and subsequent depression. However, like the SEM analyses, when reluctance to seek support was included in the model, the direct relationship between attachment-related avoidance and loneliness decreased from .67 to .44. This indicates

that avoidance of support seeking was a partial mediator in this relationship. Similarly, based on Cohen and Cohen (1983) recommendations, it can be concluded that the indirect effects of avoidant attachment to avoidant support seeking to loneliness and then depression are significant at the .001 level because each component relationship is significant at the .001 level.

As depicted in the final measurement model, the direct path between anxious attachment and reluctance to seek support improved the overall model fit. To test the mediational effect of *reluctance* to seek social support between anxious attachment, loneliness and subsequent depressive symptoms, the same steps were conducted. The first step, which assesses the direct relationship between anxious attachment and loneliness was assessed in previous analyses, and anxious attachment was a significant predictor of loneliness ( $p < .001$ ). The overall model testing the direct relationship between anxious attachment and *reluctance* to seek support, between reluctance to seek support and loneliness, and between loneliness and depressive symptoms revealed a poor fit to the data,  $\chi^2(3, N=169) = 56.90, p = .000$ ; CFI=.79, IFI=.79, RMSEA=.327(90%CI: .256-.404). However, each intermediate relationship between these variables was significant in the predictive direction ( $p < .001$ ).

The final step involves assessing the fit of the overall model when the direct relationship between anxious attachment and loneliness is added to the model. In this case, the additional path improves the fit of the data,  $\chi^2_D(1, N=169) = 30.37, p < .001$ . As expected, this indicates that avoidance of social support seeking behaviours does not fully mediate the relationship between attachment-related anxiety and loneliness and subsequent depressive symptoms. However, the effect of anxious attachment on loneliness is partially mediated by reluctance to seek support because when reluctance to seek support was included in the model, the direct path between anxious attachment

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and loneliness decreased from .58 to .33. These are the same findings that were revealed with the SEM analyses. Therefore, contrary to our predictions, reluctance to seek support is not a distinct mediator for attachment-related avoidance. Instead, reluctance to seek support mediates the relationship between both insecure attachment orientations (i.e., anxious and avoidant) and loneliness, and subsequent depressive symptoms.

Thus, path analyses are classified as one type of SEM. Although similar conclusions were drawn from the results of the SEM analyses and the path analyses, the SEM analyses measured depressive symptoms as a latent variable, whereas the path analyses measured depressive symptoms as measured variable. Both methods of analyses indicated the same overall model and findings related to mediation. Specifically, the results indicate that indirect support seeking does not serve as a complete mediator for either anxious or avoidant attachment. In contrast, reluctance to seek support partially mediates the relationship between insecure attachment (both anxious and avoidant) and loneliness, and subsequent depressive symptoms among first-year undergraduate students.

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