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Do You "Like" Me?: Reassurance Seeking on Facebook and Depression

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ABSTRACT

The objective of this study was to expand interpersonal theories of depression by incorporating online social behaviour. This study assessed the influence of Facebook reassurance seeking on concurrent depressive symptoms, as well as the moderating role of attachment anxiety in this relation. A sample of 458 undergraduates (68% female; mean age 18.54) completed self-report computer-based questionnaires of offline reassurance seeking, Facebook reassurance seeking, attachment style, and depression. Contrary to hypotheses, Facebook reassurance seeking was not associated with depressive symptoms. However, there was an interaction whereby, for those higher in attachment anxiety, more Facebook reassurance seeking was associated with lessened depressive symptoms. Findings indicate that reassurance seeking in the form of seeking "likes" may not be as harmful as offline reassurance seeking. Future studies may attempt to create online-equivalent measures of interpersonal vulnerabilities, and may include additional risk factors to understand how depressive interpersonal vulnerabilities are manifested online.

Keywords: depression; attachment; reassurance seeking; social media; Facebook.

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CHAPTER 1: INTRODUCTION

1. **Introduction**

The widespread and deleterious effects of depression demand a concerted effort to understand its vulnerability and maintaining factors. To this end, many theorists have researched the interpersonal underpinnings and consequences of depression. This has enabled the extraction of a variety of interpersonal risk factors, such as insecure attachment style and excessive reassurance seeking (ERS). The role of these interpersonal variables at present is confused by the increasingly pervasive role of online socializing. The purpose of this study is to understand how seeking reassurance on social networking websites may influence depressive symptoms, and whether insecure attachment styles moderate this relation.

1.1 Depression

According to the World Health Organization (WHO), depression is the number one leading cause of disability, and is expected to become the leading cause of disease burden by 2030 (Murray & Lopez, 1996; WHO, 2004). In Canada, representative health surveys indicate lifetime prevalence rates of 11-12% for major depressive episodes (Patten et al., 2006; Pearson, Janz, & Ali, 2013; Statistics Canada, 2017). Further, the course of depression is chronic and recurrent, with up to 85% of depressed patients reporting multiple episodes over their lifetime, and often with incomplete recovery in between episodes (Boland & Keller, 2010; Coyne, Pepper, & Flynn, 1999; Hardeveld, Spijker, De Graaf, Nolen, & Beekman, 2010; Judd et al., 2000). The widespread and chronic effects of depression can be disabling in a number of life domains.

Depression causes burden across a number of individual and social domains. According to the DSM-5, the symptoms of depression include persistent sadness or loss of interest or pleasure, changes in appetite and sleep, and cognitive impairment (American Psychiatric Association, 2013). However, the negative impact of depression extends beyond its symptoms. For instance, compared to the general population, individuals with depression are more than 20 times more likely to die by suicide (Ösby, Brandt, Correia, Ekbom, & Sparén, 2001), are at increased risk of cardiac mortality (Barth, Schumacher, & Herrmann-Lingen, 2004), and are approximately 2 times more susceptible to premature death by all causes (Almeida, Alfonso, Hankey, & Flicker,

2010; Ösby et al., 2001). Further, depression is linked with functional impairment, disruptions to social interactions and close relationships, increased work absenteeism, and prospective unemployment (Broadhead, Blazer, George, & Tse, 1990; Judd et al., 2000; Whooley et al., 2002). In effect, these areas of impairment not only affect the person with depression, but also their families, partners, and workplaces. Given these wide-ranging and potentially severe implications, it is essential that researchers gain an understanding of the influences and predictors of the onset, maintenance, and recurrence of depression.

1.2 Interpersonal Model of Depression

Interpersonal variables are among the strongest predictors of depression and its maintenance (Brown & Moran, 1994; Dozois & Beck, 2008; Eberhart & Hammen, 2006; Joiner, 2000). With this in mind, several researchers have opted to understand depression by investigating the interpersonal consequences and precipitants of the disorder. Interpersonal models of depression (Coyne 1976; Hammen, 1991) contend that individuals with depression, or with a susceptibility to depression, interact with their social environment in unique ways that generate and interact with stress to perpetuate depressive symptoms. In contrast to earlier models implicating only intrapersonal variables (e.g., Beck 1964), interpersonal models consider the responses of others and how an individual's social context can be both influenced by and influence the development of depressive symptomology.

Several interpersonal behaviours and traits have been studied for their capacity to elicit and react with stress, and to contribute to depressive symptomology. For instance, theorists have identified that depressed or depression-prone individuals engage in excessive reassurance seeking, which is shown to induce rejection and interpersonal stress, and exacerbate depression (Coyne, 1976a, 1976b; Joiner, Alfano, & Metalsky, 1992; Potthoff, Holahan, & Joiner, 1995). In addition, insecure attachment styles, including dimensions of attachment anxiety and avoidance, are concurrently and prospectively associated with depression and depressive symptoms (Eberhart & Hammen, 2006; Hankin, Kassel, & Abela, 2005; Reinecke & Rogers, 2001). Other interpersonal variables such as negative feedback seeking, sociotropy, and dependency have also shown relations to depression and to stress generation (Joiner, 1995; Mazure,

Bruce, Maciejewski, & Jacobs, 2000; Sanathara, Gardner, Prescott, & Kendler, 2003; Shih & Auerbach, 2010).

1.2.1 Interpersonal Vulnerability Online

Due to the pervasive influence and popularity of online socializing, it is necessary to adapt interpersonal models of depression to encapsulate technology-mediated interactions. For instance, there are over one billion active daily users on Facebook, which has been cited as the most popular social networking site (SNS) worldwide (Bennett, 2015; "Company Info", 2016). In addition, 59% of all Canadians have a Facebook profile, with almost half of this percentage accessing Facebook more than once a day (Bennett, 2015; "Global Social Network", 2016). Despite the ubiquity of online networking, little is known about how interpersonal vulnerabilities are manifested online, and whether negative social behaviours such as excessive reassurance seeking are similarly deleterious when expressed through online mediums.

1.3 Excessive Reassurance Seeking

Excessive reassurance seeking (ERS) is defined as "the relatively stable tendency to excessively and persistently seek assurances from others that one is lovable and worthy, regardless of whether such assurance has already been provided" (Joiner, Metalsky, Katz, & Beach, 1999, p. 270). This behaviour differs from the healthy solicitation of social support in that ERS involves persistently seeking reassurance in the same situation despite already being reassured, and social support involves the adaptive solicitation of support across different situations (Joiner et al., 1999). Additionally, social support is associated with positive health outcomes (e.g., Collins, Dunkel-Schetter, Lobel, & Scrimshaw, 1993), whereas ERS is consistently linked to depressive symptoms (Joiner, 2000; Joiner et al., 1992; Joiner, Alfano, & Metalsky, 1993; Joiner & Metalsky, 1995; Joiner et al., 1999; Joiner & Metalsky, 2001).

The construct of ERS originates from Coyne's (1976) interpersonal theory of depression. According to this theory, individuals with mild dysphoria persistently seek reassurance as to whether others truly care about them, and to alleviate doubts of self-worth. In theory, this reassurance seeking elicits incongruent messages of support and hostility. Initially, the reassuring party provides positive feedback, but the authenticity of this feedback is often questioned and attributed to obligation or pity, prompting further

feedback seeking. This repeated behaviour becomes aggravating, and thus leads to inconsistencies between the positive content of the feedback, and the negative affective reactions of the reassuring party. According to Coyne, these incongruent messages promote further insecurity and reassurance seeking, thus initiating a vicious cycle resulting in increased hostility and rejection by the reassuring party, and a worsening of depressive symptoms in the reassurance seeker. Joiner, Alfano and Metalsky (1992) have since advanced Coyne's (1976) theory of depression by identifying and empirically demonstrating ERS as the behavioural means through which interpersonal rejection, and thus further depression, is elicited.

ERS is framed as an interactive and contributory cause of depression. That is, ERS is not sufficient or necessary to cause depression, but it may contribute to depressive symptoms on its own or through interacting with stressful events (Joiner & Metalsky, 2001; Joiner et al., 1999; Potthoff, Holahan, & Joiner, 1995). In support of this notion, Starr and Davila (2008) found a moderate correlation ($r = .32$) between ERS and concurrent depression in their meta-analysis of 38 studies, reflecting that ERS may work in tandem with other variables to influence the disorder. ERS is also associated with prospective increases in depressive symptoms in samples of Air Force cadets (Joiner & Schmidt, 1998), and university students (Davila, 2001; Joiner & Metalsky, 2001, Study 4). Further, in university students, ERS is shown to interact with rejection (Joiner & Metalsky, 2001, Study 5; Katz, Beach, & Joiner, 1998), midterm failure (Joiner & Metalsky, 2001, Study 6), and minor social stressors (e.g., conflict with family or spouse; Potthoff et al., 1995), and in vulnerable children, with hassles (e.g., being teased at school; Abela, Zuroff, Ho, Adams, & Hankin, 2006), to predict increases in depressive symptoms.

Besides interacting with stress, ERS may contribute to the generation of stressors to influence depressive risk. According to Hammen's (1991, 1992) stress generation model, individuals with depression are not only passive recipients of stress but may contribute to the generation of stressors through certain behaviours or characteristics. In effect, the generation of stressors is theorized to exacerbate depressive symptoms. Combining Hammen's work with Coyne's (1976) interpersonal theory of depression, ERS is posited as an interpersonal stress-generating behaviour. In support of this

integrated model, ERS is shown to generate minor social stressors (Potthoff et al., 1995) and relationship stress (Eberhart & Hammen, 2010), which in effect, contribute to subsequent depressive symptoms. Similarly, researchers have found that ERS contributes to the generation of spousal stress (Eberhart & Hammen, 2009; Shahar, Joiner, Zuroff & Blatt, 2004), and to the generation of interpersonal stress in women (Shih & Auerbach, 2010).

In sum, Coyne's (1976) interpersonal model of depression was the first to describe reassurance seeking as a depressogenic behaviour. The concept of ERS was subsequently revised by Joiner et al., (1992), and has since been empirically shown to influence depression on its own (e.g., Joiner & Schmidt, 1998), through interacting with stressful events (e.g., Katz et al., 1998), and through generating stressful events (e.g., Eberhart & Hammen, 2010).

1.4.1 Excessive Reassurance Seeking Online

Online SNSs may facilitate reassurance seeking, as these sites offer multiple outlets through which individuals can seek reassurance with relative ease and immediacy. For instance, Facebook allows users to upload photos, to discuss thoughts, feelings, or other information via "status" updates, and it allows users to instantly message friends as desired. Each of these options offers the potential for obtaining reassurance, as friends can choose to "like" or comment on any posted updates or photos, and friends may offer reassurance through the Facebook messaging system. Further, Facebook users can opt to post updates or contact friends almost instantaneously, and at any hour of the day.

Despite the apparent ease through which reassurance can be sought online, only three studies have investigated the negative associations of reassurance-seeking behaviours on social media. Clerkin, Smith, and Hames (2013) examined Facebook reassurance seeking in university students, which was defined as the extent to which individuals posted status updates with the intention of receiving comments and feedback, and the importance that individuals placed on this feedback. The authors found that Facebook reassurance seeking predicted longitudinal decreases in self-esteem, even after controlling for offline reassurance seeking. Further, Clerkin et al. provided evidence that Facebook reassurance seeking led to greater thwarted belongingness, and greater perceived burdensomeness and that these relations were fully mediated by changes in

self-esteem. Based on the results of this study, it is possible that online reassurance seeking has undesirable consequences, similar to offline ERS.

To understand the associations between online interpersonal behaviours and depression, Nesi and Prinstein (2015) employed a 1-year longitudinal design to investigate whether online social comparison and feedback seeking (SCFS) would predict depressive symptoms in participants between 12 and 16 years old. Controlling for baseline depressive symptoms and offline ERS, the authors found that online SCFS predicted depression at 1-year follow-up. These results indicate that online feedback seeking may contribute to depressive symptoms, similar to offline ERS. However, online feedback seeking was studied in a single measure that also assessed social comparison. Thus, it is not possible to determine whether depressogenic effects can be attributed to feedback seeking, or to social comparison. Further, this measure did not discriminate between positive and negative feedback seeking, which represent theoretically distinct constructs in the depression literature (e.g., Hames et al., 2013). Accordingly, it is unclear whether effects are due to ERS or to another type of feedback seeking.

In a study by Nesi, Miller, and Prinstein (2017) depressive symptoms were used to predict online SCFS in a 3-year longitudinal study. Interestingly, this study did not assess the effects of online behaviours on depression, but rather the longitudinal effects of depression on online behaviours. In a sample of adolescents, the authors found that online SCFS was associated with concurrent depressive symptoms, after controlling for typical patterns of SCFS. Zero-order correlations between concurrent SCFS and depression were more modest, with correlations ranging from small but significant, to nonsignificant. The authors also found that for boys only, online SCFS was prospectively predicted by depression. The results of this study offer inconclusive evidence regarding the influences of online interpersonal behaviours on depression, given that the relationship under investigation used depression as a predictor, and not an outcome variable. Further, this study employs the same combined measure of social comparison and feedback seeking that was used by Nesi and Prinstein (2015). Thus, the influence of online reassurance seeking is obscured, as it is impossible to determine whether relations are due to social comparison, negative feedback seeking, or positive feedback seeking. In addition, neither this study, nor the studies by Clerkin et al. (2013) and Nesi and Prinstein (2015),

investigated the roles of related interpersonal constructs. As such, it is not possible to determine whether negative effects can be attributed to, or moderated by, a third variable such as attachment style.

1.4 Attachment Theory

Attachment theory was born from Bowlby (1969, 1973), Ainsworth (1967) and Ainsworth, Blehar, Waters, and Wall (1978), in an effort to describe individuals' characteristic patterns of thoughts, feelings, and behaviours in close relationships (for reviews, see Mikulincer & Shaver, 2003; Mikulincer & Shaver, 2007). According to Bowlby, individuals develop internal working models (IWMs) of themselves, significant others, and the relationship between the two. These working models are based on experiences with early caregivers, and reflect expectations and beliefs about attachment figures' availability and responsiveness; these IWMs are theorized to guide feelings, cognitions, and behaviours in relationships throughout the lifespan. Similar to Bowlby, Ainsworth, and Ainsworth et al. theorized that infants develop expectations of caregiver responsiveness that guide typical behavioural patterns toward attachment figures. Based on naturalistic observation and laboratory studies, these patterns became known as: (1) secure, (2) anxious/ambivalent, and (3) avoidant. Hazan and Shaver (1987) applied the concepts of early IWMs and attachment patterns to romantic relationships in adults, finding that individuals develop different attachment styles and corresponding working models that parallel the three attachment styles described by Ainsworth and colleagues. Researchers have since conceptualized attachment styles along continuums of attachment anxiety and avoidance, rather than as three discrete attachment patterns (Bartholomew & Horrowitz, 1991; Brennan, Clark, & Shaver, 1998).

Since the origins of attachment theory, researchers have revealed consistent differences between anxious attachment and avoidant attachment. Specifically, avoidant attachment is characterized by emotional distance from others, discomfort with intimacy and closeness, and a reliance on deactivating strategies. These strategies include the dismissal of relationships threats, and suppression of thoughts related to relationship distress and proximity seeking (Mikulincer & Shaver, 2003). In contrast, anxious attachment is characterized by doubts about the security of one's relationships, a strong desire for closeness and approval, and a reliance on hyperactivating strategies. These

strategies include hypervigilance to, and exaggeration of, relationship threats, and persistent proximity seeking (Mikulincer & Shaver, 2003). Secure attachment is characterized by low attachment avoidance and low attachment anxiety. This style is associated with comfort with closeness and interdependence, and proximity seeking when there is a perceived need for support (Mikulincer & Shaver, 2003).

Similar to ERS, insecure attachment is associated with prospective and concurrent depressive symptoms, and to stress generation. For instance, insecure attachment is associated with concurrent depression in psychiatric outpatients diagnosed with depression (Reinecke & Rogers, 2001), in mildly depressed women and women recovering from depression (Carnelley, Pietromonaco, & Jaffe, 1994) and in university students (Murphy & Bates, 1997; Rogers, Gotlib, & Kassel, 1996). Further, insecure attachment is associated with prospective increases in depressive symptoms (Hankin, Kassel, & Abela, 2005; Liu, Nagata, Shono, & Kitamura, 2009), and anxious attachment has been associated with depression onset over a 2-year period (Eberhart & Hammen, 2006). Insecure attachment has also predicted prospective depressive symptoms through the generation of interpersonal stressors over a 2-year period (Hankin et al., 2005), and on a daily basis (Eberhart & Hammen, 2010). Similarly, anxious attachment has been linked to prospective increases in depressive symptoms through stress generation over a 4-week period (Eberhart & Hammen, 2010).

1.4.1 Attachment Styles and Excessive Reassurance Seeking

Reassurance seeking has been theorized to originate from insecure attachment styles. According to Bowlby (1980), children with secure attachment to their caregivers will learn to self-reassure, whereas children without this security will rely on outside sources for reassurance and security. Given that avoidantly attached individuals place limits on closeness, and tend to cope by avoiding interpersonal intimacy via deactivating strategies, avoidant attachment tends to bear no relation (Shaver et al., 2005), or a negative relation to ERS (Davila, 2001; Evraire & Dozois, 2014). Additionally, Evraire and Dozois (2014) found that individuals who engaged in ERS experienced increased depressive symptomatology if they were low, but not high, in avoidant attachment. That is, engaging in ERS did not confer risk of prospective depression for individuals high in avoidant attachment. Most of the research on insecure attachment and ERS has thus

focused on anxious attachment.

Anxiously attached individuals are prone to engage in ERS due to their strong desires for closeness and approval in relationships, and their doubts about the security of their relationships (Davila, 2001; Evraire & Dozois, 2014; Shaver et al., 2005). In fact, some authors have suggested that ERS is a behavioural expression or component of anxious attachment (Brennan & Carnelley, 1999; Katz, Petracca, & Rabinowitz, 2009). In support of this contention, Shaver at al. found that ERS was no longer significantly associated with depression after accounting for attachment anxiety, suggesting that ERS is encompassed by this attachment style. In contrast, Davila (2001) found that ERS was associated with depression concurrently and longitudinally after accounting for attachment anxiety. Further, several authors have reported only mild to moderate correlations between anxious attachment and overall and daily levels of ERS, suggesting the constructs are similar but distinct (Davila 2001; Eberhart & Hammen, 2009; Evraire & Dozois, 2014; Evraire, Ludmer, & Dozois, 2014; Shaver et al., 2005).

The relationships between anxious attachment, ERS, and depression have been somewhat inconclusive in the literature. As mentioned, when accounting for anxious attachment, Davila (2001) found that ERS uniquely predicted depression, but Shaver and colleagues (2005) found that ERS did not. Research has also shown that anxious attachment may moderate the risk between depression and ERS. In a 14-day diary study, Shaver and colleagues found that anxiously attached women who engaged in ERS had a more negative mood the next day. In contrast, women with low anxious attachment had a more positive mood the day after engaging in ERS, suggesting that ERS may be negative for only a subgroup of individuals. Similarly, Evraire and Dozois (2014) found that individuals with schemas of abandonment, which reflect the fear of abandonment implicit to anxious attachment, exhibited stronger associations between ERS and prospective depression compared to those without this schema. Further, in children of parents with a history of depression, Abela et al. (2005) found that ERS interacted with general attachment insecurity to predict concurrent depressive symptoms. Specifically, children high in both ERS and insecure attachment were more likely to be depressed compared to children exhibiting high levels of only one or neither of these variables. ERS has also been shown to mediate the relation between anxious attachment and depressive

symptoms, such that anxious attachment leads to depression partially through increases in ERS (Wei, Mallinckrodt, Larson, & Zakalik, 2005). Further research is warranted to elucidate the relations between ERS, anxious attachment, and depressive symptoms.

In summary, attachment styles represent typical patterns of behaving and processing information in relationships. Insecure attachment encompasses attachment anxiety and attachment avoidance dimensions, both of which increase the likelihood of experiencing depressive symptoms, and interpersonal stress (Eberhart & Hammen, 2010; Hankin et al., 2005). Anxious attachment is associated with the negative interpersonal behaviour ERS, and these variables may work together through moderating or mediating mechanisms to influence depressive symptomology (Shaver et al., 2005; Wei et al., 2005).

1.4.2 Attachment Styles Online

Given that attachment styles guide behaviour in relationships with romantic partners and friends alike (Mikulincer & Shaver, 2007), it is reasonable to assume that one's relationship style would affect online interpersonal behaviour. Indeed, Oldmeadow, Quinn, and Kowert, (2013) found that anxious attachment predicted more frequent Facebook use, and Facebook use when feeling negative emotions ("Facebook comfort seeking"). In contrast, avoidant attachment was not predictive of these variables. This research was limited in that the researchers did not investigate the type of online behaviours that individuals engaged in. Thus, it is unclear whether anxiously attached individuals may be using Facebook for specific purposes such as reassurance seeking, and whether Facebook comfort seeking in particular may be associated with this behaviour.

In two studies by Hart, Nailling, Bizer, and Collins (2015), anxious attachment, but not avoidant attachment, significantly predicted Facebook feedback seeking (posting frequent and diverse status updates), Facebook feedback sensitivity (importance of feedback received on statuses and photos), and general Facebook use. In addition, the authors found that feedback sensitivity mediated the effect of anxious attachment on feedback seeking and Facebook use. That is, anxiously attached individuals engaged in greater Facebook use and feedback seeking due to the importance that they place on the feedback received. This suggests that, for those high in anxious attachment, greater

general Facebook use, and Facebook feedback seeking may be motivated by the desire to receive a certain type of feedback; this is consistent with the notion that these individuals will use Facebook for reassurance seeking purposes. This study is limited in that the relations between feedback seeking and feedback sensitivity with depressive symptoms were not examined. In addition, the authors did not discriminate between positive and negative feedback seeking, which is an important distinction in the literature (e.g., Hames et al., 2013).

1.5 Other Interpersonal Vulnerabilities

In addition to attachment styles and ERS, depressed or depression-prone individuals also engage in negative feedback seeking. Negative feedback seeking (NFS) is defined as the active solicitation of negative feedback and criticism. This concept was derived from self-verification theory (Swann, 1990), which posits that individuals with a negative self-concept will strive to verify their self-perceptions via NFS, even though the content of this feedback is affectively aversive (Swann, Wenzlaff, Krull, & Pelham, 1992a; Swann, Wenzlaff, & Tafarodi, 1992b). Similar to ERS, this behaviour has been linked to interpersonal rejection (Joiner et al., 1993; Joiner & Metalsky, 1995; Swann et al., 1992a), concurrent depression (Swann et al., 1992a) and future depression (Joiner, 1995). Further, NFS has been shown to interact with perceived midterm failure to predict increases in depressive symptoms (Pettit & Joiner, 2001).

Dependency and the related construct of sociotropy have also demonstrated associations with depression. Dependency has been described as a personality characteristic that reflects fears of abandonment, and a desire to be close to and dependent on others (Zuroff, Moskowitz, Wielgus, Powers, & Franko, 1983). Similarly, sociotropy is a social-cognitive trait that refers to an excessive dependence on others, and insecurity about relationships (Beck, 1983). Although these variables tend to be highly correlated, sociotropy reflects a broader dimension that includes a need for approval and recognition, that is not present in the dependency variable (Zuroff, 1994). Both of these interpersonal variables have predicted longitudinal increases in depressive symptoms (Mazure et al., 2000; Mongrain, Lubbers, & Struthers, 2004). Further, dependency and sociotropy have been linked to prospective depressive symptoms through the generation of stressors (Calvete, 2011; Shahar et al., 2004; Shahar & Priel, 2003). In addition, both

sociotropy and dependency are associated with ERS (Shahar et al., 2004; Beck et al., 2001), and ERS has been shown to mediate the link between sociotropy and depression (Beck et al., 2001). Interestingly, Davila (2001) found that sociotropy was not significantly predictive of depression after accounting for ERS and attachment anxiety.

1.5.1 Other Interpersonal Vulnerabilities Online

There is a scarcity of literature investigating the manifestations and negative effects of NFS on social media. As described earlier, a number of studies investigated general feedback seeking on social media. However, the authors did not specify whether the feedback sought was of a negative or positive nature (Clerkin et al., 2013; Hart et al., 2015; Nesi & Prinstein, 2015; Nesi et al., 2017). Given that many SNSs only offer the option of receiving "likes" (as opposed to "dislikes"; e.g., Facebook, Instagram), the use of social media for positive feedback seems particularly encouraged by the platform interfaces. This is supported by research showing that individuals tend to portray themselves in favourable and socially desirable ways (Chou & Edge, 2012). Thus, although NFS imaginably influences depressive risk through online behaviours, as it does offline, the particular configuration of SNSs promotes reassurance seeking through the emphasis on positive self-presentation and "likes".

Sociotropy and dependency have also been scarcely studied within an online context. A study by Orchard, Fullwood, Galbraith, and Morris (2014) found that higher levels of sociotropy were related to motivations of conformity (e.g., "everyone else does it"), information exchange (e.g., "communicate online"), and ritual (e.g., "habit"), in the use of social media. No studies were found relating social media usage with dependency.

1.6 Summary

In sum, there is considerable evidence that interpersonal variables, such as ERS and insecure attachment, play an important role in the onset and perpetuation of depressive episodes. Research has only begun to expand interpersonal models of depression to incorporate online forms of social interaction. The immense popularity of SNSs as a means of communicating, as well as the convenient and immediate possibility of reassurance through these platforms, demands that interpersonal behaviours are studied within the unique contexts of online socializing. Initial findings support the notion that online reassurance seeking has negative implications. However, extant

research has yet to study the moderating roles of other interpersonal variables, such as insecure attachment, in the relation between online reassurance seeking and depression. The current study aims to address these gaps in the literature.

1.7 Current Study

The purpose of the current study is to evaluate the role of online reassurance seeking on depressive symptoms, and to determine how this relationship is affected by attachment style. In addition, this study aims to compare the respective influences of online and offline ERS on depressive symptoms, and the relations between attachment styles with ERS in online and offline contexts.

Although there are a diverse number of online socializing platforms, only Facebook reassurance seeking will be considered in this study. Focusing on Facebook will build more closely onto extant research, and will simplify the interpretation of results. Further, Facebook is the most popular SNS worldwide, rendering it a reasonable choice (Bennett, 2015). Similarly, only attachment style will be considered in this study as a moderator. Given the similarities between dependency and sociotropy, and the finding that sociotropy does not predict depression beyond attachment style and ERS (Davila, 2001), it seems reasonable to examine the effects of online ERS with attachment style only to predict depression. Further, focusing on only attachment style will simplify interpretation of results and will build more closely onto extant SNS research.

1.7.1 Hypotheses and Research Questions

Based on the literature reviewed in this introduction, the following three hypotheses will be examined.

H1: *Facebook ERS will predict depressive symptomology.* Reassurance seeking through Facebook will predict concurrent depressive symptomatology. It is expected that this relationship will persist after controlling for the influences of offline ERS and attachment styles.

H2: *Attachment anxiety will moderate the relationship between Facebook ERS and depressive symptoms.* The relationship between ERS and depression will be stronger for individuals high in attachment anxiety.

In summary, it is hypothesized that ERS will predict depression, and that this relation will be stronger for those with high attachment anxiety. Due to the scarcity of

research on interpersonal variables and depression in an online context, two additional research questions will be examined in this study with no a priori hypotheses.

      Q1: *Will Facebook ERS have a similar relationship to depressive symptoms as offline ERS?* That is, will the strength of the correlations between ERS and depression be comparable across online and offline contexts?

      Q2: *Will attachment style have a similar relation to Facebook ERS as to offline ERS?* That is, will the strength of the relationships between attachment styles and ERS remain consistent for offline and online contexts? Thus, will anxious attachment have a similarly strong positive relation to both offline and online ERS, and will avoidant attachment bear a similar nonsignificant or negative relation to ERS in both contexts?

CHAPTER 2: METHOD

2. Method

2.1 Participants

Participants were 458 undergraduate students (312 female, 144 male, 2 unspecified) enrolled in Introductory Psychology at Western University. Participants' ages ranged from 17 to 37 ($M = 18.54$; $SD = 1.78$). An initial sample of 490 participants was collected, however, eight participants were removed for not completing the study, an additional eight participants were removed for taking too little or too long to finish the study (i.e., +/- 3 SDs from the mean), and 16 participants were removed for failing 3 or more (of 5) attention check questions. Of the remaining 458 participants, 53.0% identified as Caucasian, 31.3% as Asian, 1.3% as African Canadian, 1.1% as Native Canadian, .9% as Hispanic, and 12% identified as "Other". The study took an average of 50 minutes to complete.

2.2 Procedure

The Research Ethics Board of the University of Western Ontario approved the current study. Participants were self-selected for the study using the university's web-based research participation pool, where they were redirected to a series of questionnaires on an external survey-hosting website, Qualtrics. Participants indicated their consent to participate, and were subsequently directed to a series of demographic questions and questionnaires. Following their participation, participants were directed to a debriefing form and were compensated with partial course credit.

2.3 Measures[1]

2.3.1 Depressive Interpersonal Relationships Inventory – Reassurance Seeking Subscale (DIRI-RS; Joiner, Alfano, & Metalsky, 1992). The DIRI-RS is a 4-item self-report questionnaire designed to measure an individual's tendency to engage in reassurance seeking. Half of the items in this measure assessed reassurance-seeking behaviours (e.g., "Do you find yourself often asking the people you feel close to how

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[1] Additional measures assessing rumination, personality traits, and contingent self-esteem will be administered, but will not be analyzed for this study.

they *truly* feel about you?), and half of the items assessed negative social consequences of reassurance seeking (e.g., "Do the people you feel close to sometimes become irritated with you for seeking reassurance from them about whether they *really* care about you?"). Participants rated each item on a 7-point scale from 1 (*no, not at all*) to 7 (yes, *very much*). Average scores were used with a potential range from 1 to 7. This scale has shown convergent validity through associations with observed reassurance seeking behaviours (Joiner & Metalsky, 2001). Additional studies have provided support for the discriminant validity of this scale (Joiner & Metalsky, 2001; Joiner & Schmidt, 1998). Cronbach's alpha in this study was .88.

     2.3.2 Experiences in Close Relationships-Revised (ECR-R; Fraley, Waller, & Brennan, 2000). The ECR-R is a revised version of Brennan, Clark, and Shaver's (1998) Experiences in Close Relationships (ECR) questionnaire. This questionnaire consisted of 36 items to assess levels of attachment anxiety (e.g., "I often worry that my partner doesn't really love me") and attachment avoidance (e.g., "I prefer not to be close to romantic partners"). Participants rated each item on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*) based on how they generally experienced relationships, and not according to only current relationships (see Appendix A). Average scores were used with a potential range from 1 to 7. In this sample, the Cronbach's alphas for the Anxiety and Avoidance subscales were .92 and .94, respectively.

     2.3.3 Facebook reassurance seeking scale (Clerkin et al., 2013; Smith et al., 2013). This scale was initially created by Smith et al., and later condensed by Clerkin et al. to specifically assess reassurance seeking conducted on Facebook, or the extent to which individuals posted statuses, and their perceived importance of receiving feedback on these posts. The longer version of this scale has demonstrated adequate reliability and good test-retest reliability (Smith et al., 2013). For the current study, this scale was modified to include "likes" as a form of reassurance, and three items were added to incorporate photo-posting behaviours, resulting in an 8-item questionnaire. Example questions include: "When I update my status [post a photo], I expect others to comment on it or 'like' it", "When I update my status [post a photo] and no one comments on it or 'likes' it, I tend to be disappointed". Participants rated each item on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*), and average scores were used with a possible

range from 1 to 7. Questions were added in the current study in attempt to improve the content validity of Facebook reassurance seeking, as individuals can supposedly acquire assurance through photo posts as well as statuses, and through both likes and comments. In addition, it was hoped that the added questions would improve internal consistency, as Cronbach's alpha was somewhat low in Clerkin et al. (2013), α = .66. The version of this scale used by Clerkin and colleagues was moderately and significantly correlated with an existing measure of reassurance seeking, the DIRI-RS (described earlier), thus providing evidence of convergent validity. The Cronbach's alpha for this questionnaire was .82 in the current sample.

   2.3.4 Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996). The BDI-II is a 21-item self-report questionnaire designed to measure the presence and severity of unipolar depressive symptomatology. Each item was rated on a 4-point scale from 0 (*low severity*) to 3 (*high severity*) with total scores ranging from 0 to 63. Considerable psychometric evidence supports the concurrent and discriminant validity of this questionnaire as a measure of depressive severity in both clinical and undergraduate samples (Beck et al., 1996; Dozois, Dobson, & Ahnberg, 1998). The Cronbach's alpha for this questionnaire was .88 in the current sample.

2.4 Data Analytic Plan

   The purpose of the current study was to examine the influence of Facebook reassurance seeking on depressive symptoms, and to examine the contribution of related variables on this association. The variables of interest for this study were Facebook reassurance seeking (FB RS), offline reassurance seeking (ERS), attachment style, and depressive symptomatology. Relations among interpersonal variables and depressive symptoms were examined using structural equation modeling (SEM) and comparisons of dependent correlations.

   Before testing a structural model, a measurement model was tested wherein latent variables of attachment anxiety (Anxiety) and attachment avoidance (Avoidance) were created through the use of parceling. In this strategy, "parcels" are formed through aggregating two or more individual items by either summing or averaging those items; those parcels then become the indicators for latent variables. For instance, if there are 18 items in a scale, three parcels of 6 items each can be formed such that each parcel

represents the mean (or sum) of the 6 respective items. Compared to the use of individual items, parcels are more reliable and representative of latent variables, reduce problems of nonnormality, reduce the influence of idiosyncratic features of each item, reduce the number of parameters to be estimated, thus creating a more favourable parameter: subject ratio, and create more stable solutions (Bandalos, 2002; Bandalos & Finney, 2001; Little, 2013; Little, Cunningham, Shahar, & Widaman, 2002; Rushton, Brainerd, & Pressley, 1983). However, parceling is only recommended when unidimensionality of factors can be assumed or shown (i.e., when items load onto their intended factor only), and when the goal is to assess relations between constructs, rather than developing a scale or assessing relations between items (Bandalos, 2002; Bandalos & Finney, 2001; Little, 2013; Little et al., 2002). Previous research has used this parceling strategy to assess relations between attachment styles using the ECR-R and depression (Wei et al., 2005).

To test the dimensionality of the hypothesized factors, Anxiety and Avoidance, an exploratory factor analysis (EFA) was run. The factor loadings between each item and its intended factor were examined to ensure that items generally loaded onto only their hypothesized factor. Following this, a number of models were tested using parcels of varying sizes. Within each factor, parcels were created using random assignment of items to parcels; as suggested by Little (2013), items were aggregated using item means, rather than sums. Given that there are 18 items per factor, analyses were planned to include models with: 2 parcels per factor (9 items each), 3 parcels per factor (6 items each), and 6 parcels per factor (3 items each). Models were then compared and judged according to model fit and modification indices in order to choose a parcel size that provides an appropriate model fit.

After assessing measurement models, and choosing the most appropriate parcel sizes, latent variables of Anxiety and Avoidance were used in a structural equation model (SEM) alongside other interpersonal variables to test the study hypotheses. The SEM approach is advantageous in that it can assess relations among latent, or unobservable, variables as well as among observable variables. Further, SEM incorporates errors of observed variables into measurement models. Besides Anxiety and Avoidance, which were latent variables, all variables in the structural model represented observed aggregate scores.

To assess the hypothesis that FB RS is associated with depression, the latent variables of Anxiety, Avoidance, and the observed indicator FB RS were entered as predictors of depression symptoms; observed offline ERS was entered as a covariate. To assess the hypothesis that Anxiety moderates the relation between FB RS and depression, a product term was created between Anxiety and FB RS. This allowed for the assessment of a relation between FB RS and depression that varied as a function of Anxiety. Importantly, creating a product term that includes a latent variable results in issues of nonnormality that must be addressed by using specific estimation procedures (Klein & Muthén, 2007). Accordingly, Quasi-Maximum Likelihood (QML) estimation was used for this end. A drawback of this estimation procedure is that a number of traditional fit indices were unavailable.

To assess whether FB RS and offline ERS have similar relationships to depression, each correlation coefficient was converted to a *z*-score using Fisher's *r*-to-*z* transformation. Then, the coefficients were compared using an asymptotic 2-tailed *z*-test (Steiger, 1980). The same procedure was used to compare the correlations between respective attachment styles with ERS in online and offline contexts.

CHAPTER 3: RESULTS

3. Results

3.1 Preliminary Analyses

Means and standard deviations for the total sample and by gender are presented in Table 1. Means were fairly similar to those obtained in prior undergraduate samples (e.g., Evraire & Dozois, 2014; Shaver et al., 2005), except that BDI-II scores and ERS scores were more elevated in the current sample. All means were statistically equivalent between males and females, except for BDI-II scores, which tend to be higher for females (McGrath, Keita, Strickland & Russo, 1990). The BDI-II average for the total sample (M = 13.22) was on the cusp between minimal range symptoms and mild depression (Smarr & Keefer, 2011). Indices of skewness (SI), indices of kurtosis (KI), and Pearson correlations by gender are presented in Table 2. According to West, Finch, and Curran (1995) SI exceeding +/- 2, and excess KI exceeding 4 indicate substantial departures from normality. Using these criteria, SI and KI indicated that univariate distributions were approximately normal. With the exception of avoidant attachment with ERS and FB RS, FB RS with BDI-II, and FB RS with anxious attachment and ERS in the male sample, all correlations were significant with small to medium effect sizes (Cohen, 1988). Trends of Facebook and social media usage in the current sample are depicted in Appendix A. Of notable mention, most participants reported that more than 50% of time spent online is spent on SNSs.

Table 1

Descriptive Statistics by Gender

	Total Sample	Male	Female	t
	M (SD)	*M (SD)*	*M (SD)*	
ERS	3.17 (1.42)	3.01 (1.39)	3.25 (1.44)	-1.65
Anxious	3.68 (1.09)	3.64 (1.07)	3.69 (1.09)	-0.42
Avoidant	3.22 (1.08)	3.26 (1.00)	3.21 (1.12)	0.38
FB RS	4.38 (1.05)	3.90 (1.04)	4.07 (0.87)	-1.72
BDI-II	13.22 (9.48)	12.64 (8.94)	15.61 (13)	-3.03[**]

Note. ERS = excessive reassurance seeking. Anxious = anxious attachment. Avoidant = avoidant attachment. FB RS = Facebook reassurance seeking. BDI-II = Beck Depression Inventory-II.
** $p < .01$.

Table 2

Bivariate Correlations, Skewness, and Kurtosis Indices

	ERS	Anxious	Avoidant	FB RS	BDI-II
ERS	-	**.44*****	**.07**	**.19*****	**.32*****
Anxious	.32***	-	**.40*****	**.11***	**.42*****
Avoidant	-.004	.29***	-	**-.02**	**.18****
FB RS	.14	.14	-.03	-	**.03**
BDI-II	.32***	.26**	.15***	.04	-
SI	.34	-.27	-.01	-.65	1.0
KI	-.55	-.23	-.38	.50	.95

Note. Correlations beneath the diagonal represent results for male participants. Correlations above the diagonal represent results for female participants. ERS = excessive reassurance seeking. Anxious = anxious attachment. Avoidant = avoidant attachment. FB RS = Facebook reassurance seeking. BDI-II = Beck Depression Inventory-II. SI = skewness index. KI = kurtosis index.
** $p < .01$. ** $p < .01$. *** $p < .001$.

3.2 Attachment Style EFA and Measurement Model

Exploratory factor analyses (EFA) with geomin rotation were conducted using Mplus version 7.4 (Muthén & Muthén, 1998-2015), using a Maximum Likelihood (ML) procedure. Based on Hu and Bentler's (1999) cutoff criteria, a RMSEA of .06 or less, a CFI close to .95, and a value close to .08 for SRMR reflect acceptable model fit. With the exception of the SRMR, model fit indices indicated that this two-factor solution did not accurately reproduce the initial variance-covariance, $\chi^2 (559) = 2744.25$, $p < .001$; RMSEA = 0.09 (90% CI = .088 to .095); CFI = .80; SRMR = 0.06. Despite these findings, an inspection of the factor loadings reveals that items are generally consistent with the assumption of unidimensionality (Appendix B). All 18 attachment anxiety items loaded significantly onto Anxiety, with loadings greater than .40 for all but two items. All 18 attachment avoidance items loaded significantly onto Avoidance, with all loadings greater than .30.

The assumption of unidimensionality was generally supported based on factor loadings. Thus, CFA analyses were conducted using a series of parcel sizes. First, two parcels of 9 items were created for each factor using random assignment. This model fit exceptionally well according to all measures of fit, however using only two parcels may

oversimplify the data. Next, three parcels of 6 items were created for each factor using random assignment. This model fit well according to CFI and SRMR indices. Finally, a model was tested using six parcels of 3 items. This model accurately reproduced the initial variance-covariance matrix according to SRMR. The CFI also approached Hu and Bentler's (1999) cutoff value.

In order to improve fit, another model was tested based on the modification index associated with the greatest change in χ^2. Thus, within the 6-parcel solution, the residuals for two of the 6 parcels for Attachment Anxiety were allowed to correlate. This modification improved model fit, and the model accurately reproduced the initial data matrix according to CFI and SRMR indices, using Hu and Bentler's criteria (see Table 3 for all fit indices). This improvement in fit is likely due to the large correlation between items 1 (belonging to AAX31) and 2 (belonging to AAX35). According to the EFA analyses, these items had the highest correlation of all possible item-item correlations (r = .844). This correlation may seem intuitive upon inspection of the content of item 1 "I'm afraid that I will lose my partner's love." and item 2 "I often worry that my partner will not want to stay with me.", as each of these items involve the fear of losing one's partner in some way. Though, it should be acknowledged that many of the other Anxiety items also seem similar in this respect.

Each of these models can be judged as satisfactory according to at least one measure of model fit (see Table 3). Thus, for the purpose of creating latent variables for a structural model, each of these performs well. To compromise between complexity and simplicity, the model with three parcels of 6 items per factor seems ideal. The model fit indices for this solution indicate that the original matrix is fairly well-reproduced, $\chi^2(8) =$ 49.67, $p < .001$; RMSEA = 0.11 (90% CI = .08 to .13); CFI = 0.99; SRMR = 0.02. The significance of the chi-square is not surprising, given that this index is almost always significant in sample sizes above 400 (Kenny, 2015). The CFI and SRMR each indicate good model fit. See Figure 1 for model diagram. See Appendix B for Ms, SDs, and correlations among the 6 parcels.

Table 3

Confirmatory Factor Analysis: Model Fit Indices for Original and Modified Parcel Solutions

Model	χ^2(df)	RMSEA (90%CI)	CFI	SRMR
1. 2 Parcels x 9 items	0.429 (1) *p* = .51	0.00 [.000, .105]	1.000	0.001
2. 3 Parcels x 6 items	49.672 (8) *p* < .001	0.105 [.078, .134]	0.985	0.033
3. 6 Parcels x 3 items	380.884 (53) *p* < .001	0.114 [0.104, 0.125]	0.934	0.076
4. 6 Parcels x 3; correlated errors AAX31, AAX35	261.737 (52) *p* < .001	0.092 [0.081, 0.104]	0.958	0.064
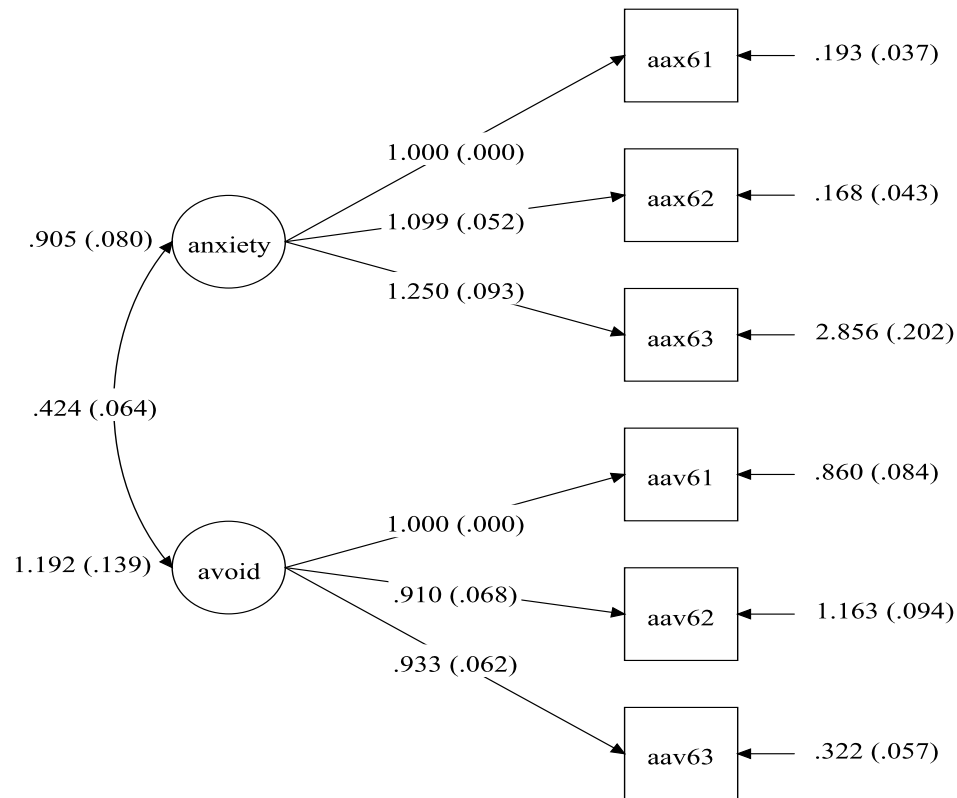
Figure 1. Measurement model for attachment anxiety and attachment avoidance latent variables, using three parcels of 6 items. Unstandardized pattern coefficients, and correlations are pictured above (standard errors in parentheses). All pattern coefficients, correlations, and variances are significant at $p < .001$. Items in each parcel are: aax61 (4, 12, 1, 11, 14, 10), aax62 (8, 13, 2, 15, 9, 16), aax63 (3, 5, 6, 7, 17, 18), aav61 (34, 20, 33, 26, 31, 21), aav62 (23, 36, 27, 28, 24, 32), and aav63 (35, 19, 22, 25, 29, 30). See Appendix B for item content.

3.3 Structural Model: Relations Among Interpersonal Variables and Depression

After establishing a sound measurement model, a structural model was tested using the latent variables of Anxiety and Avoidance, each defined by three parcels of 6 items, and observed variables of ERS, and FB RS, on depressive symptoms. This structural model also included the interaction between Anxiety and FB RS on depressive symptoms. This model was run using Mplus version 7.4 (Muthén & Muthén, 1998-2015), using a Quasi-Maximum Likelihood estimation procedure. Before running the structural model, ERS and FB RS were grand mean centered. The latent variables in the structural model did not require centering. All effects are described in unstandardized coefficients.

3.3.1 Linear Relations between Variables and BDI-II

As can be seen in Table 4, Anxiety and ERS were significantly associated with BDI scores, b = 2.86, *p* < .001, b = 1.378, *p* < .001, respectively. The relation between Avoidance and BDI scores was not significant, b = 0.57, *p* = .35, nor was the relation between FB RS and BDI scores, b = -0.29, *p* = .50. Thus, Anxiety and ERS were associated with concurrent depressive symptoms, and Avoidance and FB RS were not associated with concurrent depressive symptoms.

3.3.2 Interaction between Anxiety and FB RS

The Anxiety x FB RS interaction was significant, b = -0.98, *p* = .021 (Table 3). To better understand the Anxiety x FB RS interaction, the relation between FB RS and BDI scores was plotted across levels of Anxiety, varying from -1 *SD* to +1 *SD* in .01 increments. As depicted in Figure 2, individuals with lower levels of attachment anxiety appear to exhibit increased levels of depressive symptoms with greater FB RS. In contrast, individuals with higher levels of attachment anxiety appear to exhibit decreased levels of depressive symptoms with greater FB RS. Thus, contrary to expectations, FB RS appears to reduce depressive symptoms for those high in attachment anxiety. See Figure 3 for diagram depicting all relations, covariances, and variances.

Table 4

Structural Model Predicting BDI Scores from Insecure Attachment, ERS, Facebook RS,

and Anxiety x Facebook RS

Variables	b (SE)	p-value
Anxiety	2.859 (0.783)	< .001
Avoidance	0.574 (0.617)	.352
ERS	1.378 (0.395)	< .001
FB RS	-0.294 (0.056)	.496
Anxiety*FB RS	-0.982 (0.427)	.021

Note. $N = 458$. Standard errors of the unstandardized regression coefficients are listed in parentheses. Anxiety = latent variable of attachment anxiety. Avoidance = latent variance of attachment avoidance. ERS = excessive reassurance seeking. FB RS = Facebook reassurance seeking. Anxiety*FB RS represents the interaction between these variables.
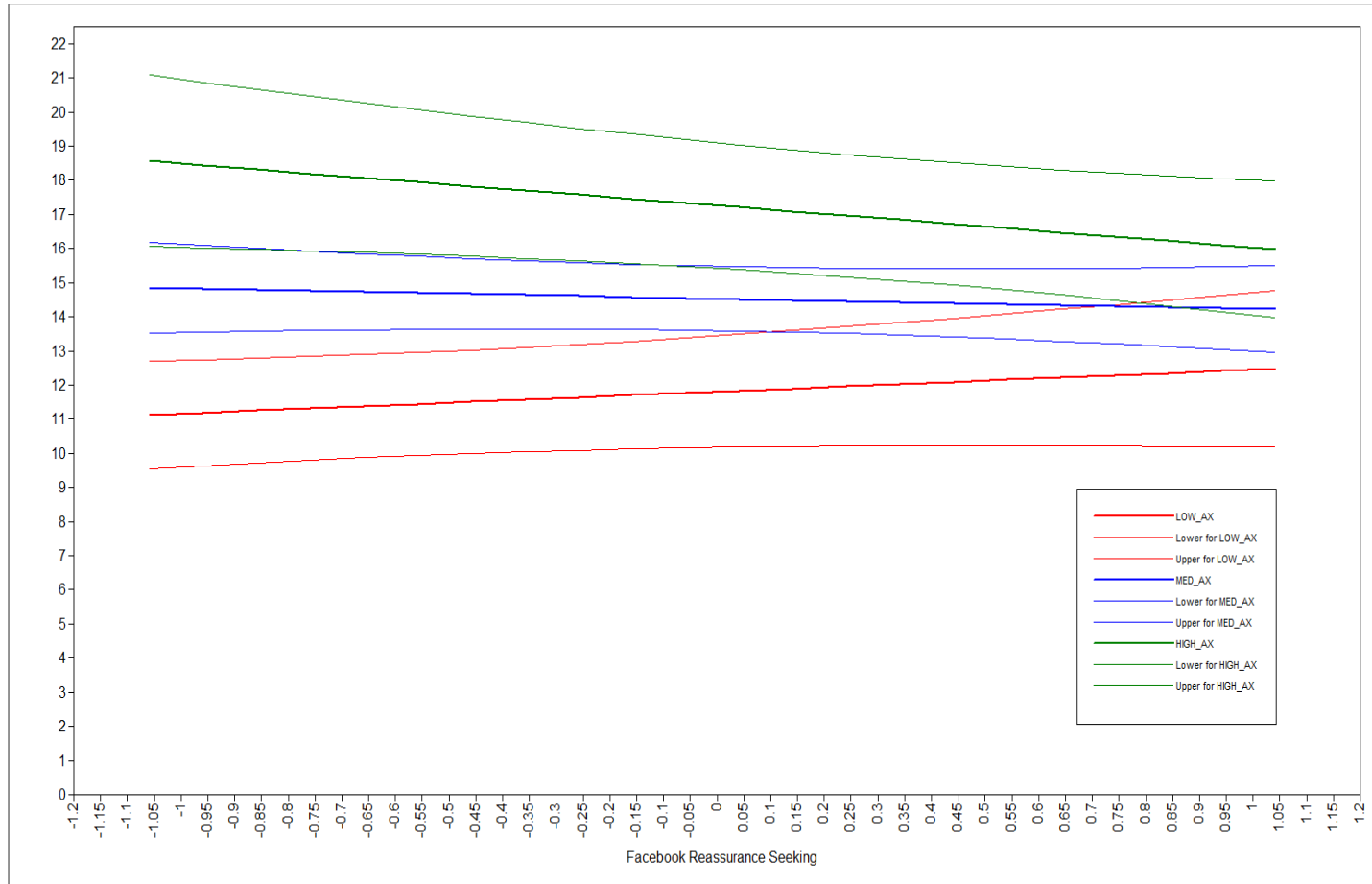
Figure 2. Beck Depression Inventory scores (y-axis) as a function of Facebook reassurance seeking at different levels of attachment anxiety. Facebook reassurance seeking is centered, so 0 represents the mean Facebook reassurance seeking score (*M* = 4.38). Attachment anxiety levels vary in 0.1 increments from -1 *SD* (Lower for LOW_AX) to +1 *SD* (Upper for HIGH_AX). Facebook reassurance seeking has been centered.
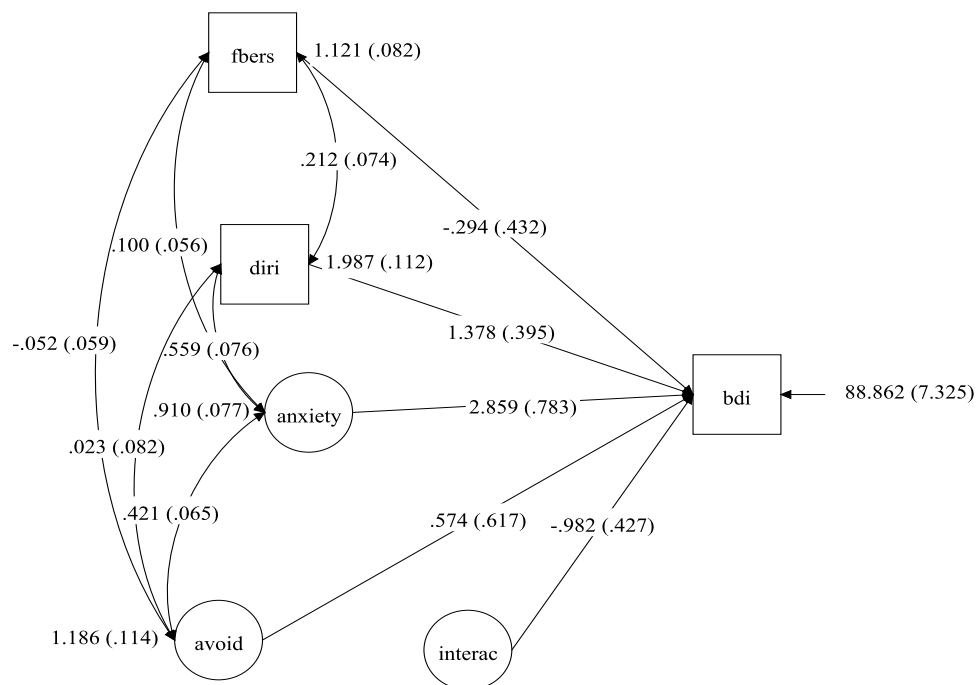
Figure 3. Unstandardized pattern coefficients and covariances are pictured above (standard errors in parentheses). Indicator parcels of Anxiety and Avoidance are left out for presentation. The covariances between Anxiety and Avoidance, and between DIRI and fbers are significant, *p* < .001, *p* = .004, respectively. Pattern coefficients are significant for BDI on Anxiety (*p* < .001), Interac (*p* = .021), and DIRI (*p* < .001). All variances are significant at *p* < .001. anxiety = anxious attachment. avoid = avoidant attachment. diri = excessive reassurance seeking. fbers = Facebook reassurance seeking. interac = the interaction between anxiety and fbers. bdi = Beck Depression Inventory-II scores.

3.4 Comparison of Correlations

To address the study research questions, a series of comparisons of dependent correlations were conducted to assess whether pairs of correlations with a shared variable were different from each other. All correlations assessed were between observed, rather than latent, variables. It was not necessary to do a formal test to compare the correlation of FB RS with BDI-II ($r = .04$) and the correlation of ERS with BDI ($r = .33$), as the former correlation was not significantly different from zero ($p = .403$), whereas the latter correlation was ($p < .001$). Thus, FB RS and ERS are differentially related to BDI-II scores.

The remaining correlations were compared using an interactive online calculator programmed to compare correlations, from the same sample, with one variable in common (Lee & Preacher, 2013). The correlations were compared by converting each correlation coefficient into a *z*-score, and then comparing them with an asymptotic *z*-test. Using this procedure, the correlation between attachment anxiety and ERS ($r = .40$) was found to be significantly different from the correlation between attachment anxiety and FB RS ($r = .12$), $z = -4.977$, $p < .001$. In contrast, the correlation between attachment avoidance and ERS ($r = -.04$) was not significantly different from the correlation between attachment avoidance and FB RS ($r = -.03$), $z = 0.167$, $p = .867$. Thus, it appears that attachment anxiety is differentially related to ERS and FB RS, whereas attachment avoidance is similarly uncorrelated with both ERS and FB RS.

CHAPTER 4: DISCUSSION

4. Discussion

It was hypothesized that higher levels of Facebook reassurance seeking would be associated with increased depression, controlling for offline ERS and attachment styles. Further, it was hypothesized that attachment anxiety would moderate the relation between Facebook reassurance seeking and depression such that those higher in attachment anxiety would exhibit a stronger relationship. That is, it was expected individuals high in attachment anxiety, that engage in higher levels of Facebook reassurance seeking, would have particularly high levels of depressive symptoms. Neither hypothesis was supported by study results.

Research questions addressed whether Facebook reassurance seeking exhibited similar relationships to depression and attachment styles as ERS. Results indicated that the relationship between ERS and depression was different than the relationship between Facebook reassurance seeking and depression. Additionally, Facebook reassurance seeking and ERS exhibited different relationships with attachment anxiety. Finally, the relationship between Facebook reassurance seeking and avoidant attachment was not significantly different from that of ERS and avoidant attachment.

The hypothesized relation between Facebook reassurance seeking and depression was not supported. SEM analyses indicated that Facebook reassurance seeking was not significantly predictive of depressive symptoms. In SEM procedures, it is possible that a predictor is not significant due to substantial shared variance with the other predictors. However, the nonsignificant zero-order correlation between Facebook reassurance seeking and depression revealed that this was not the case.

The lack of relation between Facebook reassurance seeking and depression is at odds with general research on ERS and depression, and with research on online feedback seeking. Contrary to current findings, several authors have indicated that general ERS is associated with concurrent and prospective depression (Davila, 2001; Joiner & Metalsky, 2001; Joiner & Schmidt, 1998; Starr & Davila, 2008). In addition, feedback seeking on social media has been associated with concurrent and prospective depression (Nesi et al., 2017; Nesi & Prinstein, 2015), and Facebook reassurance seeking has been associated

with decreased self-esteem (Clerkin et al., 2013). The inconsistent results of this study are especially surprising given that Clerkin et al. used the same Facebook reassurance seeking measure that was used for present analyses. In contrast, the measure used by Nesi et al., and Nesi and Prinstein simultaneously assessed social comparison as well as feedback seeking. Thus, it is possible that items corresponding to social comparison were responsible for the reported relations between depression and feedback seeking. This would be consistent with past research indicating that Facebook use is associated with depression through increases in envy (Tandoc, Ferrucci, & Duffy, 2015).

It is possible that Facebook reassurance seeking was not associated with depression in this study due to differences in how offline and online forms of reassurance were operationalized. Specifically, the way that Facebook reassurance seeking was defined in this study may not capture the excessive nature of reassurance seeking that is implicit to the offline measure of ERS. To elaborate, the DIRI-RS (Joiner et al., 1992), which measures offline ERS, includes 4 items; half of these items relate to the excessive nature of reassurance seeking in terms of negative social consequences (e.g., "Do the people you feel close to sometimes become irritated with you for seeking reassurance…", "Do the people you feel close to sometimes get 'fed up' with you for seeking reassurance…"). In contrast, the Facebook Reassurance Seeking Questionnaire (Clerkin et al., 2013) used in this study only included statements regarding expectations to receive "likes" and comments, and no statements pertaining to whether others become irritated with reassurance-seeking behaviours. It is thus possible that the reassurance measures for online and offline contexts are not equivalent in terms of their relative "excessiveness" or burdensomeness, resulting in different respective associations with depression.

It is possible that seeking reassurance on Facebook through "likes" is not as harmful as seeking reassurance face-to-face due to limits on the forms of communication that are available through SNSs. In Coyne's (1976) interpersonal model of depression, he states that individuals will seek repeated reassurance, thus initiating a depressogenic spiral, due to incongruent messages received by the reassuring party. Coyne states that these incongruent messages are a result of different levels of communication, including body language, other verbal messages, and tone of voice. For example, a reassuring party may indicate positive assurance through speech, but may also convey disapproval

through negative body language or angry tone of voice. Given that Facebook reassurance seeking elicits reassurance in the form of "likes" without accompanying body language or verbal messages, it is possible that reassurance seeking in this way does not lead to incongruent messages and resultant insecurity, further reassurance seeking, rejection, and depression, in the same manner as offline ERS.

Differences in the nature of reassurance sought in online versus offline contexts may contribute to their discrepant relations with depression. According to Joiner et al., (1999) ERS comprises the persistent tendency to seek assurance that one is lovable and worthy. Given the emphasis on receiving feedback to specifically affirm self-worth and lovability, ERS reflects underlying doubts about lovability and self-worth. In contrast, Facebook reassurance seeking, as defined in this study, consists of posting photos and statuses with the expectation of receiving comments or likes. It was assumed that the expectation of receiving "likes" and comments reflected a desire to obtain virtual approval and reassurance from peers, in regards to what was assumed to be self-promotional and positive-reassurance seeking content. However, Facebook reassurance seeking does not imply that one feels inadequate or doubts his or her self-worth. Theoretically, Facebook reassurance seeking could be motivated by a simple desire to convey an important message through a status, or milestone through a photo, or a desire to receive positive reinforcement through "likes" without accompanying self-doubts. Accordingly, ERS may reflect underlying negative self-views that result in a more maladaptive form of reassurance seeking, whereas Facebook reassurance seeking may encompass healthy and unhealthy forms of feedback-seeking behaviours.

The hypothesized interaction between attachment anxiety and Facebook reassurance seeking was also not supported by analyses. Attachment anxiety moderated the association between Facebook reassurance seeking and depressive symptoms. However, the nature of this interaction was in the opposite direction to that which was predicted. Specifically, it was predicted that Facebook reassurance seeking would be more strongly positively associated with depressive symptoms for those high in attachment anxiety. However, it was found that higher levels of Facebook reassurance seeking were associated with decreased levels of depressive symptoms for those high in attachment anxiety. This is inconsistent with previous literature that has found ERS to be

particularly predictive of depressive symptoms for those high in anxious attachment, and fears of abandonment (Evraire & Dozois, 2014; Shaver et al., 2005).

As described earlier, it is possible that Facebook reassurance seeking is defined in a non-pathological way in this study. It could be that those high in attachment anxiety are fulfilling their higher needs for closeness and attachment with Facebook reassurance seeking without irritating close friends or partners, or without receiving incongruent messages that suggest irritation and rejection. Thus, the increased levels of social communication on Facebook might be beneficial for those with greater attachment needs. This contention is somewhat supported by the finding that SNS use is beneficial in maintaining weak social ties for those who are lower in self-esteem (Ellison, Steinfield, & Lampe, 2007; Steinfield, Ellison, & Lampe, 2008), and that those with low self-esteem feel more comfortable with self-disclosure on SNSs (Forest & Wood, 2012). Given that anxious attachment is consistently associated with low self-esteem (Cooper, Shaver, Collins, 1998; Mickelson, Kessler, & Shaver, 1997), SNS use may also be linked to affiliative benefits, and thus protection against depressive symptoms, for those high in anxious attachment.

In addition to specific hypotheses, this study sought to explore whether Facebook reassurance seeking exhibited similar relationships as ERS. Specifically, the strength of the correlation between ERS and depression was compared across offline and online contexts. Additionally, the strength of the correlations between attachment styles and ERS was compared across offline and online contexts.

Given that ERS was significantly associated with depression, and Facebook reassurance seeking was not, no formal test was required to compare correlations. Results indicate that ERS is significantly more strongly associated with depression than Facebook reassurance seeking. This could be due to a number of factors, as described earlier. For instance, ERS implies negative social consequences and low self-worth, by definition, which could increase the likelihood of experiencing depressive symptoms. In addition, the constraints of SNSs allow for a more narrow range of expression, which may prevent the perception of incongruent assurance, and thus the perpetuation of reassurance seeking and depressive symptoms.

The correlation between attachment anxiety and ERS was stronger than the

correlation between attachment anxiety and Facebook reassurance seeking. In this case, however, both correlations were positive and significant. The difference in correlation strength could be due to the more pathological operationalization of ERS, compared to Facebook reassurance seeking. As already described, ERS encompasses feelings of low self-worth and doubts about one's lovability, by definition. These negative characteristics of ERS are also implicit to attachment anxiety, and associated hyperactivation strategies. In contrast, the definition of Facebook reassurance seeking does not necessarily imply feelings of low self-worth and doubts about one's lovability. Thus, Facebook reassurance seeking likely encompasses a broader range of motivations underlying feedback seeking, in addition to the desire for approval that is reminiscent of attachment anxiety.

The correlation between attachment avoidance and ERS did not significantly differ from the correlation between attachment avoidance and Facebook reassurance seeking. In both cases, correlations were nonsignificant. This is consistent with past findings that attachment avoidance is not related to reassurance seeking (Shaver et al., 2005).

4.1 Limitations and Future Directions

A number of limitations in the current study should be noted and addressed in future research. First, because of the novelty of SNS use, there were very few measurement instruments to assess online reassurance seeking. Of the available options, the Facebook reassurance seeking scale (Clerkin et al., 2013) was the only measure that was not contaminated with social comparison. However, this measure was only used in one prior study (Clerkin et al.) and has not been assessed for temporal reliability, and construct validity. A comparison of this measure with the offline measure of ERS reveals a number of important differences, as described earlier. To more fully explore the phenomenon of online reassurance seeking, future research may attempt to create an equivalent measure to offline ERS, and to ensure that this measure meets adequate validity and reliability requirements.

The measurement instrument of offline ERS, the DIRI-RS (Joiner et al., 1992), is also problematic for a number of reasons. This 4-item self-report measure was unanimously used to assess ERS in every study reviewed in the introduction, and all 38 studies in Starr and Davila's (2001) meta-analysis, thus offering no methodological

variance. Due to the narrow operationalization of ERS, it is impossible to determine whether the relations between ERS, depression, Facebook reassurance seeking, and attachment styles would remain consistent across different measurement methods. Further, the concept of reassurance seeking is largely tied to this single instrument, which begs the question, *"What is ERS?"* Across virtually all studies on reassurance seeking, the working definition of ERS is defined as a DIRI-RS score, restricting the boundaries and understanding of the concept of ERS to the confines of this single instrument. Despite these shortcomings, the DIRI-RS has demonstrated strong psychometric properties, and positive associations with observer-rated reassurance seeking (Joiner & Metalsky, 2001).

Another limitation of the current study is that only Facebook behaviours were assessed, without considering other SNSs. This was due to a number of reasons, including that this platform is the most widely used worldwide (Bennett, 2015), and that no other measure of SNS reassurance seeking was available. Besides Facebook, Instagram and Twitter are popular SNSs that emphasize sharing personal content that can be liked or commented on. Instagram differs from Facebook in that users can only upload photos, and Twitter differs in that users mainly post short statuses. These distinct SNSs are shown to attract different audiences (Greenwood, Perrin, & Duggan, 2011), and so the relations observed based on one media outlet may not generalize to other platforms.

The use of a cross-sectional design is also a limitation. It is not possible to determine if the combination of anxious attachment and Facebook feedback seeking leads to longitudinal changes in depressive symptoms given the single time point in this study. Future research can examine prospective relations between Facebook reassurance seeking and depression. Given the negative correlation between Facebook reassurance seeking and depression for those high in anxious attachment, future studies could incorporate potential mediators in this relation. In particular, given the more vague definition of Facebook reassurance seeking as compared to ERS, future research could consider adaptive (e.g., increased perceived social support, decreased feelings of loneliness) as well as maladaptive (e.g., decreased self-esteem, increased perceived rejection) consequences of Facebook feedback seeking. Additional interpersonal variables, such as NFS, could also be incorporated into future research to more thoroughly model online

interpersonal behaviour.

The findings from this study can also be considered in light of existing theory. Branching from Coyne's (1976) interpersonal model of depression, ERS has been theorized and empirically shown to exacerbate depressive symptoms (e.g., Starr & Davila, 2008; Joiner et al., 1999). However, the form of reassurance seeking assessed in the present study did not relate to depression. The contrast between past and current findings raises questions about what constitutes *excessive* reassurance seeking. As previously mentioned, almost all past research has used the 4-item DIRI-RS to measure ERS, resulting in a narrow understanding of the behaviour. Future research could qualitatively explore the different ways in which individuals report seeking reassurance, in terms of mediums (e.g., Facebook or face-to-face), content (e.g., lovability, appearance), and form of reassurance (e.g., through "likes", Facebook messenger, verbal reassurances). Further, future studies could examine how various methods of reassurance seeking are related to negative or positive outcomes, to specifically understand when reassurance seeking become excessive and negative.

4.2 Concluding Remarks

In the present study, there was no main effect of Facebook reassurance seeking on depression. Individuals who engaged in more Facebook reassurance seeking were not more likely to experience depressive symptomology. However, there was an interaction between attachment anxiety and Facebook reassurance seeking. Individuals who engaged in Facebook reassurance seeking were less likely to experience depressive symptoms if they were high in anxious attachment. Although hypotheses were not supported, it is nevertheless possible that interpersonal risk factors are expressed in unique ways through social media, thus conferring increased risk for depression. However, based on the present results, it seems that posting photos and statuses to receive "likes" and comments is not associated with depression in the way that offline reassurance seeking is. Further, it is possible that Facebook reassurance-seeking behaviour is associated with beneficial outcomes for a subset of individuals, as evidenced by the significant interaction. More research is needed to explore the ways in which interpersonal risk factors are manifested through online communication.

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Appendix A

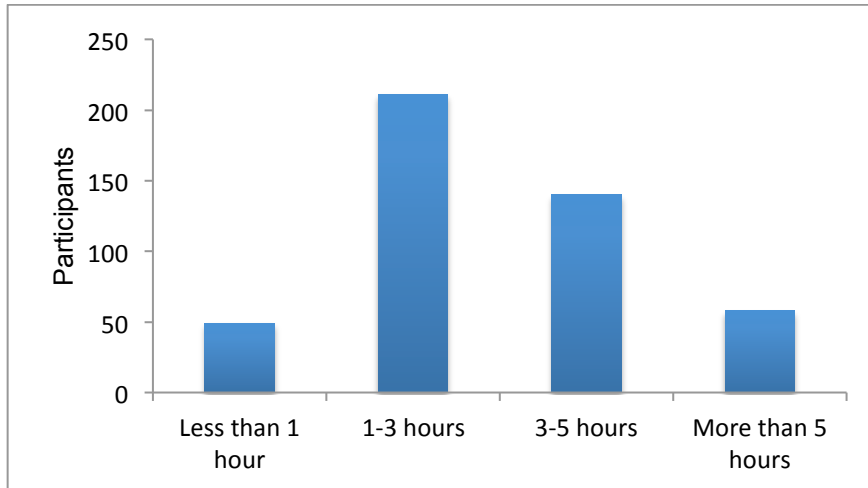## Trends in Social Media and Facebook Usage for the Current Sample

Figure 1. Amount of time spent on social networking sites each day.
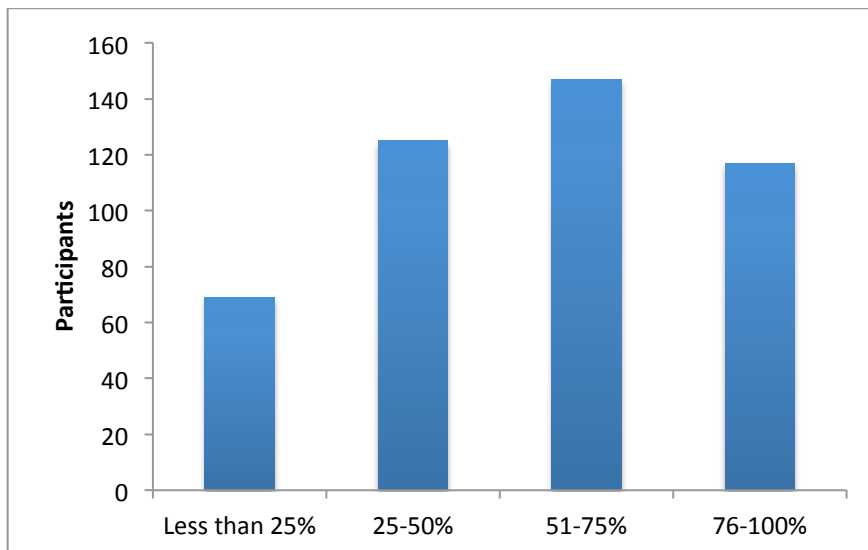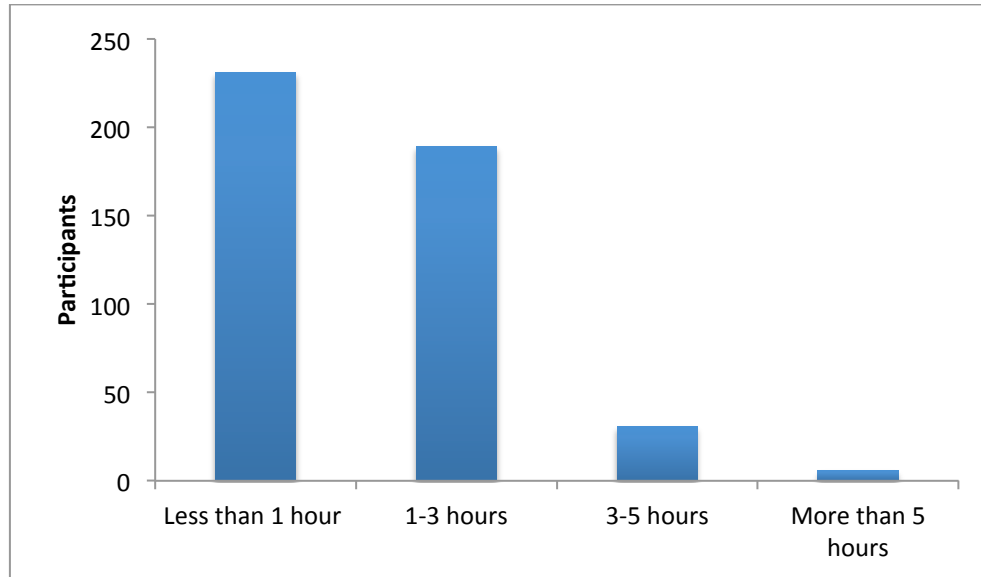

Figure 2. Percentage of time online spent on social media sites.

Figure 3. Amount of time spent on Facebook each day.

Appendix B

Exploratory Factor Analysis for Attachment Styles

Table 1

Exploratory Factor Analysis: Pattern Coefficients for Two-Factor Model of ECR-R

Indicator	Anxiety	Avoidance
1. I'm afraid that I will lose my partner's love.	**.780*** (0.02)	-.092* (0.08)
2. I often worry that my partner will not want to stay with me.	**.838*** (0.02)	-.070 (0.00)
3. I often worry that my partner doesn't really love me.	**.779*** (0.02)	.137* (0.10)
4. I worry that romantic partners won't care about me as much as I care about them.	**.837*** (0.02)	-.070 (0.07)
5. I often wish that my partner's feelings for me were as strong as my feelings for him or her.	**.785*** (0.02)	- .011 (0.05)
6. I worry a lot about my relationships.	**.784*** (0.02)	-.074 (0.06)
7. When my partner is out of sight, I worry that he or she might become interested in someone else.	**.695*** (0.03)	-.007 (0.07)
8. When I show my feelings for romantic partners, I'm afraid they will not feel the same about me.	**.706*** (0.03)	.126* (0.04)
9. I rarely worry about my partner leaving me.[a]	.211* (0.05)	.159* (0.05)
10. My romantic partner makes me doubt myself.	**.530*** (0.05)	.227* (0.04)
11. I do not often worry about being abandoned.[a]	.190* (0.03)	.175* (0.04)
12. I find that my partner(s) don't want to get as close as I would like.	**.538*** (0.03)	.243* (0.04)
13. Sometimes romantic partners change their feelings about me for no apparent reason.	**.569*** (0.03)	.210* (0.04)
14. My desire to be very close sometimes scares people away.	**.533*** (0.04)	.076 (0.04)
15. I'm afraid that once a romantic partner gets to know me, he or she won't like who I really am.	**.543*** (0.03)	.225* (0.04)
16. It makes me mad that I don't get the affection and support I need from my partner.	**.557*** (0.03)	.180* (0.04)
17. I worry that I won't measure up to other people.	**.609*** (0.03)	.002 (0.03)
18. My partner only seems to notice me when I'm angry.	**.450*** (0.04)	.283* (0.04)

19. I prefer not to show a partner how I feel deep down.	.284* (0.04)	**.481*** (0.04)
20. I feel comfortable sharing my private thoughts and feelings with my partner.[a]	.007 (0.03)	**.734*** (0.02)
21. I find it difficult to allow myself to depend on romantic partners.	**.356*** (0.04)	**.350*** (0.04)
22. I am very comfortable being close to romantic partners.[a]	-.019 * (0.03)	**.773*** (0.02)
23. I don't feel comfortable opening up to romantic partners.	.312* (0.04)	**.526*** (0.03)
24. I prefer not to be too close to romantic partners.	.217* (0.04)	**.578*** (0.03)
25. I get uncomfortable when a romantic partner wants to be very close.	.189* (0.04)	**.540*** (0.03)
26. I find it relatively easy to get close to my partner.[a]	.007 (0.03)	**.740*** (0.02)
27. It's not difficult for me to get close to my partner.[a]	-.028 (0.04)	**.639*** (0.03)
28. I usually discuss my problems and concerns with my partner.[a]	-.036 (0.03)	**.805*** (0.02)
29. It helps to turn to my romantic partner in times of need.[a]	-.125* (0.03)	**.820*** (0.02)
30. I tell my partner just about everything.[a]	-.006 (0.02)	**.800*** (0.02)
31. I talk things over with my partner.[a]	-.070 (0.03)	**.811*** (0.02)
32. I am nervous when partners get too close to me.	.209* (0.04)	**.596*** (0.03)
33. I feel comfortable depending on romantic partners.[a]	.066 (0.04)	**.679*** (0.03)
34. I find it easy to depend on romantic partners.[a]	.099* (0.04)	**.715*** (0.02)
35. It's easy for me to be affectionate with my partner.[a]	-.049 (0.04)	**.721*** (0.02)
36. My partner really understands me and my needs.[a]	.058 (0.04)	**.698*** (0.03)
r (Anxiety with Avoidance)	0.144*	
χ^2	10.141***	
RMSEA	[0.000, 0.056]	
Number of estimated parameters	23	

Note. Parameter standard errors listed in parentheses. Loadings greater than .3 are in boldface.

[a] Items are reverse-coded.

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

Appendix C

Descriptive Statistics and Correlations for 6-item Parcels

Table 1

Descriptive Statistics for 6-item Parcels Assessing Attachment Anxiety and Avoidance

	Attachment Anxiety			Attachment Avoidance		
	Parcel 1	Parcel 2	Parcel 3	Parcel 1	Parcel 2	Parcel 3
M (SD)	3.58 (1.04)	3.74 (1.12)	3.64 (1.25)	3.40 (1.16)	3.20 (1.09)	3.15 (1.15)
Kurtosis	-.061	-.136	-.316	-.214	-.416	-.630
Skewness	-.301	-.213	-.204	.061	-.073	-.023

Table 2

Correlations Among 6-item Parcels Assessing Attachment Anxiety and Avoidance

	AAx1	AAx2	AAx3	AAv1	AAv2	AAv3
AAx1	1.000					
AAx2	0.845	1.000				
AAx3	0.545	0.523	1.000			
AAv1	0.269	0.323	0.141	1.000		
AAv2	0.272	0.322	0.144	0.501	1.000	
AAv3	0.263	0.344	0.183	0.670	0.594	1.000

Note. AAx = Attachment anxiety. AAv = Attachment avoidance. All correlations are significant $p < .001$.

Appendix D

Ethics Approval Notice

Western Research

Research Ethics

Western University Non-Medical Research Ethics Board
NMREB Delegated Initial Approval Notice

Principal Investigator: Dr. Donald Saklofske
Department & Institution: Social Science\Psychology, Western University

NMREB File Number: 108678
Study Title: Facebook Behaviour and Depressive Risk

NMREB Initial Approval Date: December 03, 2016
NMREB Expiry Date: December 03, 2017

Documents Approved and/or Received for Information:

Document Name	Comments	Version Date
Western University Protocol	Received November 17, 2016	
Recruitment Items	SONA Recruitment	2016/11/17
Instruments	Measures - Received November 17, 2016	
Other	Debriefing	2016/11/17
Letter of Information & Consent		2016/12/03

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the above named study, as of the NMREB Initial Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Curriculum Vitae

Name: Callista Forchuk

Post-secondary   University of Western Ontario
Education and   London, Ontario, Canada
Degrees: 2010-2014 B.A.

                      The University of Western Ontario
                      London, Ontario, Canada
                      2015-present M.A.

Honours and   Graduate Scholarship
Awards: 2015-present

Related Work   Teaching Assistant
Experience   The University of Western Ontario
                      2015-2017

                      Psychology Statistics Tutor
                      The University of Western Ontario
                      2014, 2017

Publications and Presentations:

1. **Forchuk, C.,** & Saklofske, D. (2017, June). An investigation of the relationship between Facebook reassurance seeking and depression. Poster presented at the Canadian Psychological Association 78th Annual Conference, Toronto, ON.

2. Lau, C., & **Forchuk, C.** (in press). Hopelessness. In B. J. Carducci (Editor-in-Chief) & A. Di Fabio, D. H. Saklofske, & C. Stough (Vol. Eds.), The Wiley-Blackwell encyclopedia of personality and individual differences: Vol. III. Personality processes and individual differences. Hoboken, NJ: John Wiley & Sons.

3. **Forchuk, C.,** Feher, A., & Saklofske, D. (2016, June). Linking Compassion and Emotional Intelligence: A Preliminary Study. Poster presented at the Canadian Psychological Association 77th Annual Conference, Victoria, BC.

4. **Forchuk, C.,** & Vernon, P. A. (2015, July). Individual differences in ownership reasoning: A twin study. Poster presented at the International Society for the Study of Individual Differences (ISSID) Conference, London, ON.

5. **Forchuk, C.,** & Vernon, P. A. (2015). Individual differences in ownership reasoning: A twin study. *Western Undergraduate Psychology Journal, 3*(1).

6. **Forchuk, C.,** & Vernon, P. A. (2014, April). Individual differences in ownership reasoning: A twin study. Poster presented at the Western University Psychology Undergraduate Poster Session, London, ON