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The Role of Attachment in Young Adults' Use of Facebook for Coping

Jaime Michelle Arseneault

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The Role of Attachment in Young Adults' Use of Facebook for Coping

by

Jaime Michelle Arseneault

A Dissertation
Submitted to the Faculty of Graduate Studies
Through the Department of Psychology
in Partial Fulfillment of the Requirements for
the Degree of Doctor of Philosophy at the
University of Windsor

Windsor, Ontario, Canada

2012

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DECLARATION OF ORIGINALITY

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ABSTRACT

The Internet has become integrated into the daily lives of adolescents and young adults, and researchers have begun to investigate the predictors, correlates, and consequences of Internet use. Research has suggested that individuals with social strengths and individuals with social weaknesses both may benefit from using the Internet to cope. The purpose of this study was to explore the relations among attachment, offline coping, online coping, and adjustment, as well as to evaluate whether the rich-get-richer or social compensation hypotheses of Internet use explained these relations. Undergraduate students aged 17 to 25 years ($N = 296$) completed online measures of their Internet and Facebook use, attachment anxiety and avoidance, offline coping, online coping through Facebook, well-being, and distress. Results showed that the relation between higher levels of attachment anxiety and greater distress was partially mediated by online coping. Attachment avoidance was not related to online coping, but the relation between higher levels of attachment avoidance and decreased well-being was partially mediated by less frequent use of adaptive offline coping strategies. An alternative model suggested a possible reciprocal path indicating that individuals higher in both distress and well-being reported greater frequency of online coping. Further analyses of online coping indicated that most subtypes were related to more intense usage of Facebook, greater attachment anxiety and avoidance, greater use of avoidant coping strategies offline, greater distress, and reduced well-being. These results suggested that the relations among attachment, offline coping, online coping, and psychosocial adjustment are more complex than can be explained by either the rich-get-richer or social compensation hypotheses. Implications of these findings for the development of pathological Internet use also are outlined.

DEDICATION

To my husband, Jamie.

We share one name and one heart.

I could not have done this without you.

ACKNOWLEDGEMENTS

I would like to sincerely thank my advisor, Kimberley Babb. I have learned so much from you and genuinely believe that I am a better researcher for having worked with you over the past seven years. Your commitment to my work over the course of my graduate education has been notable and I sincerely appreciate your dedication. I also would like to thank my committee members, Patti Fritz, for sharing your knowledge of adolescent social relationships and structural equation modelling and for always being warm and supportive, Robert Orr, for supporting our goal of developing a computer-mediated communication research group at the University of Windsor from the very beginning, and Kai Hildebrandt, for being so supportive of my research and providing invaluable feedback.

Thank you to Craig Ross, for sharing your knowledge of website design and enabling me to complete the online data collection for this study. I also would like to thank the other founding members of the University of Windsor's computer-mediated communication research group: Emily Orr, Mary Simmering, and Mia Sisic. Each of you contributed to this study either directly or indirectly and I appreciate your input, as well as your willingness to enter the brave new world of Internet research. Emily and Mary, your support and friendship over the course of graduate school will always be treasured.

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CHAPTER I

INTRODUCTION

Overview

Attachment relationships have been the subject of psychological investigation for nearly a century, although it is only within the past two decades that researchers have begun to examine the role of attachment in individuals' coping choices. With the ever-increasing popularity of online social communication tools, such as social network sites, the Internet provides an entirely new context for coping that did not exist until quite recently. As such, it is important to extend theories of attachment and coping to an online context in order to develop a more comprehensive understanding of individuals' coping choices in the variety of contexts available in the 21st century.

The Internet has become an important socialization influence to an extent never before seen in previous generations (e.g., Greenfield & Yan, 2006). According to Statistics Canada (2010), 94% of Canadians aged 16 to 45 years access the Internet regularly, with 96% of these Internet users reporting that they access the Internet at home. Eighty-six percent of Internet users between the ages of 16 and 35 years use social network sites. Nationwide surveys conducted by the Environics Research Group (2001) revealed that 99% of Canadian youth, age 9 to 17, reported that they use the Internet to some extent. The majority of these students (70%) reported having used the Internet for the first time when they were between the ages of 8 and 12 years old. It is likely that these usage numbers are even higher today, given the advances in Internet accessibility, speed, ease of use, and the increase in the number of online social networking applications available to users. Thus, by the time individuals reach adolescence and young adulthood, they are likely to be experienced Internet users.

Over the past decade, millions of adolescents and young adults have joined social network sites such as Facebook (www.facebook.com). Despite the immense popularity of online socializing, research on the correlates and consequences of Internet use in general, and social network sites in particular, has not kept pace. Very few researchers have examined online coping or the role of attachment in Internet use, and fewer still have examined these variables with regard to Facebook. To the author's knowledge, there are no published studies examining the role of attachment in coping on Facebook. Given this lack of research, we simply do not yet know whether and how young adults are using social network sites to cope with stressors in their lives. We also do not yet understand how attachment patterns developed throughout childhood and early adolescence might influence the ways in which these individuals use sites such as Facebook.

The purpose of the present study was to examine the relations among young adults' attachment styles, coping choices on Facebook and in real life, and psychosocial adjustment. This study addressed gaps in the literature by asking the following questions: (1) In what ways do young adults use Facebook for coping? (2) How does the quality of attachment relationships affect young adults' use of Facebook for coping? (3) What are the relations among young adults' online coping choices, real-life coping skills, and psychosocial adjustment?

To address these questions, participants completed online measures of their attachment styles, offline coping, online Facebook coping, and psychosocial well-being and distress. The relations among these variables were explored to understand whether young adults' attachment styles were associated with their offline and online coping choices and whether these coping choices mediated the association between attachment and adjustment outcomes. An additional goal of this study was to understand how young

adults were coping online and whether these online coping choices were similar to their offline coping preferences.

CHAPTER II

REVIEW OF LITERATURE

History of the Internet and Social Network Sites

Bargh and McKenna (2004) describe the Internet as combining the features of the major technological advances that came before it, in that the Internet is both interactive (as is the telephone) and a mass medium (as is the television). As such, this technology presents a revolutionary way for individuals to communicate. Although communicating through computers via the Internet seems to be a recent development, the origins of today's Internet can be traced back to the development of computation technology in the early nineteenth century (Moschovitis, Poole, Schuyler, & Senft, 1999). These computation machines eventually gave rise to mainframe computers, and in turn, personal computers. As computer technology became more practical, efficient, accessible, and user-friendly, government and military agencies (in the United States and England, in particular) began to examine the possibility of exchanging large amounts of information through computers. In 1969, the work of the U.S. government, together with the contributions of several U.S. universities, resulted in the first network that linked computers in distant locations. Rapid developments in computer networking over subsequent decades resulted in the Internet that we access today when going online (Moschovitis et al., 1999).

Although the Internet was initially created by the U.S. government as a tool for national defense, early users quickly embraced the opportunity to become acquainted with and to communicate with like-minded people about a variety of topics (Moschovitis et al., 1999). Early methods of communicating via the Internet included e-mail (first developed in 1971) and online public conferencing through a program called PLATO Notes

(introduced in 1973; Moschovitis et al., 1999). These were followed by multi-player online games; bulletin board systems; and news, discussion, and message boards/groups (all first made available in 1979; Moschovitis et al., 1999).

The single most popular use of the Internet is for interpersonal communication (Gross, 2004; Kraut et al., 1998; McKenna & Bargh, 1999; Tyler, 2002). This can be accomplished through e-mail, chat rooms, discussion boards, newsgroups, instant messaging programs such as Windows Live Messenger (www.messenger.live.com), and social network sites such as Facebook, MySpace (www.myspace.com), Twitter (www.twitter.com), and Google+ (plus.google.com). These latter websites are referred to as “social network sites” because they are primarily used to make pre-existing offline social networks visible to an online community, rather than to actively initiate new relationships (as implied by the term “social *networking* sites”; boyd & Ellison, 2008). According to boyd and Ellison (2008), social network sites are defined as those Internet-based services that share three common properties. First, users can create a profile within the site with varied levels of control over who has access to this profile. Second, users can make their connections with other users explicit in the form of a list of contacts. Third, users can explore the profiles and connections of those users who are in their contact list.

A review by boyd and Ellison (2008) described the history of social network sites. The first of these modern websites (www.SixDegrees.com) began in 1997. Others followed at the pace of one or two per year until a dramatic increase in social network sites began in 2003. Currently, there are approximately 200 active social network sites, excluding dating websites. These vary by target audience (e.g., age, cultural/ethnic group), focus on shared interests (e.g., music, books, videos, photography), and source of

online social contacts (e.g., articulating “real world” social networks versus meeting new people).

Facebook

Facebook is one such social network site. Launched in February 2004 by Mark Zuckerberg and three other students from Harvard, Facebook was originally intended to link together students at distinct college campuses. Initially, a Harvard University e-mail address was required in order to set up a Facebook profile. Within a few months, additional networks were created for other Ivy-League colleges in the United States. In September 2005, access to Facebook was expanded to include high school networks. Following further network additions in September 2006, access to Facebook was granted to anyone who wished to join, provided they indicated that they were at least 13 years old (<http://newsroom.fb.com/content/default.aspx?NewsAreaId=20>).

According to the Facebook site statistics, Facebook has over 900 million active users from around the world and over half of these people log on to Facebook at least once per day. The average user spends over 55 minutes per day on the site (<http://newsroom.fb.com/content/-default.aspx?NewsAreaId=22>). Each user creates a “Profile” page that typically includes a profile photo, their name, a “Status” (an optional statement provided by the user as to their mood, current behaviour, requests for information, or anything else they wish to share), personal information (ranging from sex, birth date, and relationship status to political and religious views and favourite quotes), contact information (e-mail address, phone number, mailing address), education and work information, photo albums, Groups to which the user belongs (users can join Facebook Groups based on shared interests), pages that the user “Likes” (indicating that they are a fan of the pages of celebrities, sports teams, etc.), “Notes” the user has posted (e.g.,

journal entries or links to other websites), and a “Friends” list. Friends lists are developed when users search for individuals by name or browse lists of users and make requests for the individuals to become their Friends. If these “Friend Requests” are accepted by the other individuals, they are added to the user’s Friends list. Both the amount of personal information posted and the people to whom the information is visible are controlled by the user. Privacy options for information on a user’s profile range from information being visible to “Everyone” (anyone who searches the individual on Facebook) to “Only Friends” (only those people that the individual has authorized as a Friend can view the information). Various additional “Applications” are available, such as games that can be played alone or with other users, trivia, quizzes, organizational tools (e.g., daily schedule planners), links to other websites, and Applications that allow users to send various virtual gifts to their Friends. There are currently over nine million such Applications available to Facebook users (<http://newsroom.fb.com/content/default.aspx?NewsAreaId=137>).

Facebook has four main communication tools: the “Wall”, Private Messages, Facebook Chat, and “Events”. Each user’s Profile page contains a Wall, on which other users can make “Wall Posts,” which are public messages to that person. The Wall is visible to all individuals who have access to the user’s profile (usually Friends, but this depends on the user’s privacy settings). Facebook also has a “Message” option, which functions in a manner similar to e-mail. That is, each user has a private inbox for Messages, and can send Messages to any of their confirmed Friends. Incoming and outgoing Messages are only visible to the intended recipient(s), and thus are considered private. Facebook Chat functions in a manner similar to other instant messaging services. Once logged into their Facebook account, users can view which of their Friends are

online and engage in a private, real-time conversation with one or more of them. An additional way to facilitate social interaction through Facebook is provided by the Events function, although this function is not used for everyday communication in the same way as the other communication options. Instead, users can create a profile page promoting an offline event, invite guests from their Friends list (or leave the event open to any Facebook members who happen to see it), track who is and is not attending, and provide information such as time, date, and location.

Browsing of other users' Profile page content and Facebook activity is facilitated by the Facebook "News Feed." Upon logging into Facebook, the user's own "Home" page is presented. The Home page presents a random list of the activity of the user's Friends. This could include Friends' Status updates, Wall Posts to other Friends, new pictures, Groups joined, use of Applications, or updates to their personal information. Users have control over the information that appears in the News Feeds of their Friends through management of their own list of recent activity on their profile page (i.e., users can delete recent activities that they do not want their Friends to see).

A study by Pempek, Yermolayeva, and Calvert (2009) provided detailed descriptive data on Facebook use by young adults in the U.S. Their study was conducted to determine how, how much, and why undergraduate students were using Facebook. Ninety-two participants completed a diary measure each day for seven days to record their time on Facebook (minutes/day) and the activities in which they engaged on Facebook (e.g., posting photos, reading others' Wall Posts). After completing the diary measure, participants provided information about their recent Facebook activity, characteristics of their Facebook profile (e.g., number of Friends), and their demographic information. On average, participants reported spending approximately half an hour per

day on Facebook (range = 0 to 165 minutes). The most frequently reported use of Facebook was communication, primarily with friends they also knew in offline contexts, such as school. Other popular uses of Facebook included having fun (entertainment), fighting boredom, taking a break from work, and finding out about or planning events. Participants also used Facebook to share information about their identity, including posting photos and posting information about their media preferences, demographics, political/religious views, and work/school information. Fewer than 10% of participants reported using Facebook to make new friends or romantic contacts. The researchers also found that 65% of participants were frequently “lurking” on Facebook; that is, they were spending their Facebook time viewing other users’ posted information (particularly by reading their News Feed and viewing their Friends’ Profiles and photos) without posting their own content.

More recent studies also have provided descriptive data on undergraduate students’ Facebook use. Findings from these studies suggest that students are increasingly integrating Facebook into their daily lives. For example, a study by Kalpidou, Costin, and Morris (2011) provided further information about undergraduate students’ use of Facebook. In their study, 70 undergraduate student participants reported spending an average of 60 to 120 minutes on Facebook each day. The average number of Facebook Friends was 200 to 250. As part of a larger study, Sheldon, Abad, and Hinsch (2011) collected information about Facebook use from an entire cohort of first year students taking an introductory psychology course ($N = 1,002$). Ninety-six percent of these students reported using Facebook and 78% of them reported that they used Facebook every day. Both of these studies were conducted in the United States. Similar results have been reported for studies conducted in Canada. For example, Muise, Christofides, and

Desmarais (2009) reported on the Facebook use of 308 university undergraduate students in Ontario, aged 17 to 24 years. These participants also reported frequent use of Facebook each day ($M = 38.93$ minutes, $SD = 32.13$ minutes) and their number of Facebook Friends ranged from 25 to 1,000 Friends ($M = 296.19$, $SD = 173.04$).

These findings, in conjunction with the information presented on the Facebook website about the number of users and frequency of use, demonstrate that Facebook has become an enormously popular part of Westernized culture and has been integrated into everyday life for young people in North America, as well as in many other countries around the world.

Research on Online Social Interaction

Despite the immense popularity of and substantial amount of time that individuals spend on social network sites like Facebook, published research on this new aspect of social life has been quite limited. Initially, most published studies on the Internet were based on data collected in the late 1990s and early 2000s, before Facebook became widely available and used. A search of the literature revealed that there were 69 published articles on Facebook between 2007 (when Facebook first appeared in the psychology literature) and 2009 (at the time this dissertation was proposed). This has increased almost fourfold since that time, with 266 published studies between 2010 and the first half of 2012. Studies that have investigated psychosocial issues relating to Facebook have examined diverse topics, including uses and gratifications (i.e., how and why individuals use these sites; Bonds-Raacke & Raacke, 2010; Raacke & Bonds-Raacke, 2008; Sheldon, 2008), personality correlates and motivations for use (e.g., Buffardi & Campbell, 2008; Hughes, Rowe, Batey, & Lee, 2012; Moore & McElroy, 2012; Orr et al., 2009; Ross et al., 2009), privacy issues and victimization (e.g., Christofides, Muise, & Desmarais, 2009;

Christofides, Muise, & Desmarais, 2012; Higgins, Ricketts, & Vegh, 2008; Lewis, Kaufman, & Christakis, 2008), jealousy (Muise et al., 2009), identity exploration and impression management (e.g., Pempek et al., 2009; Rosenberg & Egbert, 2011; Tong, Van Der Heide, Langwell, & Walther, 2008; Zhao, Grasmuck, & Martin, 2008), and use of Facebook to accumulate and maintain social capital (Ellison, Steinfield, & Lampe, 2007; Ellison, Steinfield, & Lampe, 2011; Steinfield, Ellison, & Lampe, 2008).

Because these authors have approached Facebook research from different theoretical perspectives, a comprehensive understanding of why so many individuals are using Facebook is not yet available. One possible explanation for the popularity of social network sites like Facebook is that it helps individuals meet important social and psychological needs, such as belongingness, intimacy, identity, and self-esteem (e.g., Baumeister & Leary, 1995; Bonds-Raacke & Raacke, 2010; Maslow, 1943; McKenna & Bargh, 1999). These needs may serve as important motivations for individuals to seek out social interaction on the Internet. The question of whether this social Internet use has been mostly positive or negative continues to be a topic of great debate (e.g., Bargh & McKenna, 2004; Gross, 2004; Kalpidou et al., 2011; Kraut et al., 2002; Kujath, 2011; Manago, Taylor, & Greenfield, 2012; Tyler, 2002). Moschovitis and his colleagues (1999) summarized concerns about the impact of the Internet on traditional relationships when they stated, "Some...worry that the digital age is breaking human communities apart, rather than bringing people together in any effective way. Could the success of online communities lead to fewer and fewer people interacting in person?" (p. 271). Examining the consequences of online social interaction will contribute to an understanding of whether these online interactions are indeed beneficial in meeting these important needs.

Two competing hypotheses have been proposed to explain the effects of Internet communication on users' well-being: the displacement hypothesis and the stimulation hypothesis. According to the displacement hypothesis, time spent engaging in online communication displaces time spent with existing offline social contacts, thus reducing the quality of those offline relationships. It is implicitly assumed that the quality of online communication is inferior to that of real-life relationships, and thus greater online communication should be related to reduced well-being (e.g., Kraut et al., 1998; Valkenburg & Peter, 2007a). In contrast, the stimulation hypothesis proposes that online communication stimulates the quality of existing real-life relationships by increasing the amount of time spent together and the amount of communication. As such, greater online communication is thought to be related to increased well-being (e.g., Subrahmanyam, Kraut, Greenfield, & Gross, 2000; Valkenburg & Peter, 2007a, 2007b). Thus, the two hypotheses differ not only in outcome (reduced versus greater well-being), but also in their views of to whom the majority of online communication is directed: the stimulation hypothesis assumes that online communication is occurring with existing friends, whereas the displacement hypothesis assumes that this communication is occurring with strangers.

Research exploring the validity of the displacement and stimulation hypotheses has produced conflicting findings. Early research in this area tended to support the displacement hypothesis (e.g., Kraut et al., 1998; Mesch, 2003, 2006). For example, an early study called the HomeNet study investigated the impact of home Internet availability over the first one to two years of use (Kraut et al., 1998). For this study, members of 73 families were provided with a home computer and Internet access, which the researchers used to track the usage patterns of all family members above the age of 10 years. In addition, family members completed measures of their social involvement

(family communication, size of local and distant social networks, and perceived social support) and their psychological well-being (loneliness, stress, and depression) prior to this Internet access and at follow-up, which varied from 12 to 24 months later. Results indicated that more frequent use of the Internet was related to decreases in family communication, declines in the size of both local and distant social networks, and increases in loneliness, depression, and daily life stressors. Kraut and his colleagues (1998) labeled this effect the “Internet paradox”; that is, they noted that although the Internet is a “social technology,” primarily used for interpersonal communication, greater use of this social medium may lead to decreased social interaction and an associated decrease in well-being.

To explain this paradox, Kraut and his colleagues (1998) suggested that their participants were replacing strong social ties with weak social ties. Strong ties are relationships characterized by great breadth, depth, and commitment (Wellman & Wortley, 1990). In contrast, weak ties are transient relationships between people who rarely see one another and who share few interests or pursuits (Kraut et al., 1998). Because this study was conducted before home Internet access was widespread, few of the real-life contacts of the participants were available for online communication. Therefore, the majority of the participants reported chatting with strangers, and very few of these contacts developed into offline friendships. These results support the displacement hypothesis in that greater time spent online seemed to displace important strong-tie relationships with family and friends, thus leading to declines in psychological well-being.

If the limited accessibility of the Internet was the primary reason for displacement effects, then as home Internet use became more widespread, researchers would expect to

find that participants were increasingly using the Internet to communicate with existing friends and family members. This modified pattern of Internet use would then have different implications for relationship quality and well-being. In fact, using half of their original participants from the 1998 HomeNet study, Kraut and his colleagues (2002) conducted a follow-up study one year later and found that most of the negative effects of first Internet exposure had dissipated. Specifically, the previous relations between Internet use and poorer psychosocial adjustment were no longer significant, with the exception that greater Internet use was associated with higher levels of stress. Interestingly, Internet use predicted significant decreases in depression over this later time period. At the time of this follow-up study, Kraut and his colleagues (2002) also replicated their study with a new sample of participants to examine whether Internet use was related to displacement or stimulation effects three years after the original HomeNet study. Overall, their results revealed that Internet use predicted greater community and social involvement and greater well-being at both 6 months and 1 year later.

The results from both the follow-up and replication studies by Kraut and his colleagues (2002) support the stimulation hypothesis. Although not directly assessed, the authors suggested that these positive outcomes for Internet use were most likely related to the more widespread usage of the Internet at this later time, as well as the introduction of instant messaging services that allowed real-time communication with others. These developments likely resulted in greater online communication with pre-existing friends and family members, and thus decreased depression and greater social involvement and well-being offline.

More recent studies have directly examined whether online interaction is now occurring primarily with individuals known from offline contexts or with strangers. These

studies have generally supported Kraut and his colleagues' (2002) suggestion that most online social interaction stimulates relationships because it involves individuals known from other contexts (e.g., Kujath, 2011; Reich, Subrahmanyam, & Espinoza, 2012). For example, Kujath (2011) investigated whether U.S. college students were predominantly using Facebook and MySpace to create new relationships by connecting to strangers or to maintain existing offline relationships. Participants aged 16 to 32 years ($N = 183$) completed self-report measures of their social network site use, methods for adding contacts, and patterns of interaction with their contacts online and in face-to-face interactions. Kujath found that 40% of Facebook and MySpace users reported that their online contacts solely consisted of people they knew in offline contexts and 75% of the sample reported primarily using these sites to maintain relationships with offline contacts. The participants who did report having online-only contacts reported having an average of only seven such contacts on their Friends list¹. Only 8% of respondents agreed that they frequently used Facebook and/or MySpace to develop new online relationships. Overall, these results are more consistent with the stimulation hypothesis in that they support the proposition that most online interaction is occurring with Internet users who also are known in real life.

¹ Kujath (2011) did not report participants' total number of contacts so it is not possible to provide an exact percentage of online-only contacts. However, recent studies (e.g., Kalpidou et al., 2011) have suggested that users of social network sites report an average of 200 to 250 Friends. If all but seven of these Friends were known offline, this would suggest that approximately 97% of contacts are known from offline contexts.

Other research also has supported the stimulation hypothesis (e.g., Amichai-Hamburger & Hayat, 2011; Valkenburg & Peter, 2007a; Wellman, Quan Haase, Witte, & Hampton, 2001). For example, Amichai-Hamburger and Hayat (2011) investigated whether Internet use was stimulating or displacing social contact through analysis of data from the ongoing World Internet Project (WIP). According to the WIP website, “The World Internet Project is a major, international, collaborative project looking at the social, political and economic impact of the Internet and other new technologies” (<http://www.worldinternetproject.net/#about>). The participating countries administer the same questionnaires to respondents (with translations as needed), allowing direct comparisons of responses across countries. Amichai-Hamburger and Hayat examined data from 22,002 respondents in 13 participating countries from around the world. Consistent with their hypotheses, they found that total Internet usage (how many hours per week respondents used the Internet for any purpose) was positively correlated with participants’ perceptions of increases in contact with family, friends, and people with the same profession, religion, and/or political interests. These results support the stimulation hypothesis in that spending more time online was related to more contact with individuals known offline. However, Amichai-Hamburger and Hayat did not examine whether or how these increases in contact were related to relationship quality or well-being.

In contrast, Valkenburg and Peter (2007a) examined the relationship quality and well-being aspects of the stimulation hypothesis. They asked 10- to 17-year-old Dutch adolescents to complete an online survey for which they reported the frequency and duration of their instant messaging and chat use, the time spent with friends offline, their perceptions of the quality of these offline friendships, and their general well-being. Ninety-one percent of participants stated that they primarily used instant messaging to

communicate with existing friends and time spent using instant messaging was positively related to time spent with friends offline. Further mediation analyses indicated that time spent with friends offline mediated the positive relation between time spent instant messaging and quality of friendships, and that the quality of friendships mediated the positive relation between time spent with friends and well-being. In other words, more time on instant messaging was related to more time spent with friends offline, and spending more time with friends offline was related to greater relationship satisfaction, approval, and support. This greater quality of relationships, in turn, predicted greater well-being above and beyond time spent with friends offline. This pattern of results suggests that instant messaging had a positive influence on the quality of adolescents' pre-existing friendships, consistent with the predictions of the stimulation hypothesis.

Despite this trend of increasing support for the stimulation hypothesis, other authors have reported no significant findings in support of either hypothesis (e.g., Gross, 2004), or found support for both stimulation and displacement effects depending on the type of Internet use examined (e.g., Blais, Craig, Pepler, & Connolly, 2008) or the specific outcomes measured (e.g., Baker & Oswald, 2010; Lee, 2009; Lee & Kuo, 2002; van den Eijnden, Meerkerk, Vermulst, Spijkerman, & Engels, 2008). For example, Gross (2004) investigated the Internet use of seventh- and tenth-grade students through daily reports of their online activities, as well as questionnaires assessing their depression, loneliness, social anxiety, friendship quality, and offline activities. Overall, participants reported private communication (i.e., e-mail and instant messaging) to be the online activity in which they engaged most frequently and for the longest duration. Gross reasoned that displacement effects would occur if adolescents were primarily using the Internet to communicate with strangers. On the contrary, she found that 84% of instant

messaging was carried out with pre-existing offline contacts, particularly friends or best friends from school. No significant relations were found between participants' time spent online (in any activity) and any of the well-being measures. However, these nonsignificant findings should be interpreted with caution for several reasons. First, Gross' study examined relations between Internet use and well-being before access to social network sites such as Facebook became widely accessible (particularly for young adolescents). Second, the young adolescents in her study were likely to be relatively new Internet users, given that she collected data in 2000 and 2001 when home Internet use was just beginning to become widespread. Finally, she collected data over only four days, and finding evidence for stimulation and/or displacement effects during that time when social network sites were not widely available would likely require examination of a longer time frame, as relationships would be developed or neglected through time spent communicating online.

Blais and her colleagues (2008) used a longitudinal design in their study on the impact of various Internet activities on students' important relationships. Participants, age 14 to 18 years, were asked to complete measures assessing their use of the Internet for four different types of activities, as well as measures assessing the quality of their relationships with their same-sex best friends and their romantic partners. Participants completed these measures at the outset of the study, and again one year later. Results indicated that using the Internet for instant messaging was related to greater commitment, trust/communication, and intimacy/companionship in both best friend and romantic relationships one year later, provided that individuals rated themselves high on these variables at Time 1. On the other hand, the authors found that use of chat rooms was negatively related to later intimacy/companionship in best friend relationships, and that

using the Internet for entertainment was negatively related to later commitment and intimacy/companionship in both friendships and romantic relationships. These results support both the stimulation and displacement hypotheses. That is, using the Internet to engage in private, interpersonal communication with pre-existing contacts seemed to stimulate the positive qualities of these relationships, whereas using the Internet to communicate with strangers (more common in chat rooms) and/or for non-social entertainment was negatively related to relationship quality, suggesting displacement of time for important relationships.

Other authors also have found support for both the stimulation and displacement hypotheses within the same study (e.g., Lee, 2009; van den Eijnden et al., 2008). For example, Lee (2009) collected data from a representative sample of the U.S. population as part of a longitudinal study that began in 1997. In the first wave of the study, parents were interviewed about their children's quality of social relationships and internalizing behaviours. In 2002-2003, 12- to 18-year-old adolescents whose parents had participated in the first wave were asked to complete an interview and a two-day time diary. The interview assessed how often they used the Internet in the past month, the cohesiveness of their relationships with their parents and friends, and how connected they felt to their schools (i.e., how much they felt like part of their school, how close they felt to people at their school, and how happy they were to be at their school). Results indicated that time spent communicating online displaced time spent with parents. Specifically, a one-hour increase in time communicating online was related to a 24-minute decrease in time spent with parents. However, this displaced time did not result in any significant effects on the cohesiveness of the parent-child relationship. In addition, time spent communicating online was not related to time spent with friends, although online communication was

positively related to friendship cohesiveness. Lee suggests that although adolescents' time online may displace time spent with parents, some of this displaced time may be normative. With or without the Internet, adolescents tend to increasingly engage in activities, usually with peers, that result in decreased time spent with their parents. This is supported by the finding that this displaced time did not significantly impact the quality of the parent-child relationship. On the other hand, spending time communicating with friends online stimulated the quality of adolescents' peer relationships. These findings suggest that positive stimulation effects may primarily operate within the peer realm.

Overall, although some studies have produced mixed results, research findings generally support a stimulation effect on relationships for online communication that occurs with pre-existing contacts (e.g., Blais et al., 2008; Kraut et al., 2002; Lee, 2009; Valkenburg & Peter, 2007a; Wellman et al., 2001). Research supporting the displacement hypothesis (e.g., Kraut et al., 1998; Mesch, 2003, 2006²) usually involved collection of data in the 1990s and early 2000s. At that time, the Internet was much less commonly used for communication; therefore, it was unlikely that the friends and family members of early Internet users would have been available for online communication. Time spent online was often used to browse websites or communicate with strangers (e.g., via chat rooms and message boards), displacing time spent with pre-existing social contacts (Kraut et al., 1998). As home Internet access, instant messaging programs, and social network sites became more widely available, the likelihood that adolescents were engaging in online communication with their offline friends increased. This seems to have resulted in

² Mesch's (2003, 2006) studies of the relation between Internet use and family relationships involved data collection in 2000 and 2001, respectively.

stimulation of the quality of these relationships, as more frequent online communication has been associated with more intimate relationships, greater social support, and in turn, lowered depression and loneliness.

Given this support for the stimulation hypothesis, Valkenburg and Peter (2007a) proposed that researchers should investigate the explanatory mechanisms by which online communication may increase the quality of existing friendships. Lee (2009) also noted the importance of examining individual characteristics that may predict who benefits from time spent communicating online and why they derive these advantages. Kraut and his colleagues (2002) proposed two hypotheses to account for stimulation effects, that is, to explain how users' different personal characteristics may positively influence the outcomes of their Internet use. The "rich-get-richer" hypothesis predicts that individuals who possess greater social resources (i.e., individuals who are more extraverted, more socially skilled, less socially anxious, and/or who have larger social support networks) derive more benefit from Internet use. Because these individuals are more socially skilled, they are more likely to use the Internet to communicate in ways that promote greater intimacy and social support in relationships. This, in turn, leads to more satisfying relationships and greater well-being. In contrast, the "social compensation" hypothesis predicts that individuals with fewer social resources (i.e., individuals who are more introverted, socially anxious, and lacking in social support) will benefit most from the Internet. This hypothesis proposes that online communication will enable these introverts to develop new relationships and/or develop greater intimacy in pre-existing relationships in a less threatening context. For example, for individuals whose anxiety interferes with their abilities to communicate and socialize in face-to-face interactions, the Internet provides a less intrusive environment in which they have more control over the amount,

type, and timing of information that is shared. This context reduces the anxiety they experience, thus making them more willing to engage in social interactions and to further develop relationships.

McKenna and Bargh (1999) presented evidence in support of a social compensation model in their review of early Internet research. In their analysis, they explained why some individuals sought out relationships online and how individuals were using the Internet to meet important psychological and social needs. Specifically, they identified self-related motivations for using the Internet, such as having a stigmatized or constrained identity, and social motivations, such as social anxiety, loneliness, and safety concerns. Positive consequences of Internet use for these populations included greater self-acceptance and acceptance by others, “coming out” or disclosure of stigmatized identity aspects to face-to-face contacts, decreased feelings of alienation, increased size of social networks, and development of new real-life relationships. These benefits may not have been available to these individuals without online communication and would not be necessary for individuals with more positive offline relationships.

Other researchers have found that individuals who score higher on variables such as introversion (e.g., Goby, 2006), shyness (e.g., Baker & Oswald, 2010; Stritzke, Nguyen, & Durkin, 2004) and low offline social support (e.g., Bessière, Kiesler, Kraut, & Boneva, 2008) also derive benefits from Internet use that they might not otherwise obtain (e.g., greater social interaction). For example, Baker and Oswald (2010) conducted a study to examine the relations among use of Facebook, friendship quality, perceived available social support, and loneliness for individuals varying in shyness. Data were gathered from undergraduate students (M age = 19.19 years) who completed online measures of shyness, friendship quality, perceived social support, loneliness, and

Facebook use. Consistent with the social compensation hypothesis, Facebook use positively predicted satisfaction with Facebook Friends, importance of and closeness to Facebook Friends, and greater perceived social support from these Friends, but only for those individuals who reported higher levels of shyness. There were no significant predictive effects of Facebook use on these dependent variables for individuals who reported lower levels of shyness. Individuals who reported greater shyness also reported gaining significantly more knowledge about others through Facebook use and feeling significantly closer to others because of Facebook use. These findings are consistent with a social compensation model of Internet use for shy individuals.

On the other hand, many researchers have reported support for the rich-get-richer hypothesis (e.g., Kraut et al., 2002; Lee, 2009; Sheldon, 2008). For example, in the study by Kraut and his colleagues (2002), Internet use was positively related to social involvement and well-being; however, further analyses revealed that these associations differed by level of extraversion/introversion and social support. Specifically, at follow-up, extraverted individuals who reported more frequent Internet use also reported increases in the number of people in their local and distant social circles, increases in their face-to-face interactions with family and friends, greater trust in others, greater self-esteem, as well as decreased levels of loneliness, negative affect, and time pressure. In contrast, introverted individuals reported less community involvement and decreased well-being. Because extraverted individuals would be expected to have more social interactions initially, and introverted individuals would be expected to have fewer social interactions, these results support the rich-get-richer hypothesis. Similarly, for those individuals who reported greater social support at Time 1, Internet use was positively related to family communication at follow-up.

Lee (2009) also compared the rich-get-richer and social compensation hypotheses in her longitudinal study of 12- to 18-year-olds' Internet use. Results of mediation analyses supported the rich-get-richer hypothesis. Specifically, quality of relationships during childhood (at Time 1) was positively related to the frequency of online communication during adolescence, which was related to more cohesive friendships in adolescence. In addition, cohesive friendships were positively related to connectedness to school, demonstrating an indirect effect of online communication on school connectedness. Lee explained these results by suggesting that adolescents with poorer quality social relationships have less need to engage in online communication; instead, it is the adolescents who have numerous positive relationships who use e-mail, instant messaging, and chat to maintain and improve these relationships.

In summary, although early research on social network websites found support for displacement effects of Internet use on pre-existing relationships (e.g., Kraut et al., 1998), more recent Internet research suggests that online social interaction with pre-existing social contacts, such as school friends, stimulates well-being through positive effects on friendship quality and frequency of interaction (e.g., Blais et al., 2008; Kraut et al., 2002; Valkenburg & Peter, 2007a; Wellman et al., 2001). However, it is not yet clear whether those individuals who possess pre-existing strengths (rich-get-richer) or weaknesses (social compensation) benefit most from online socializing (Kraut et al., 2002), or whether individuals with both characteristics benefit by using the Internet differently (e.g., Lee, 2009; Raacke & Bonds-Raacke, 2008). The present study will explore these hypotheses with regard to individual characteristics that may predict who will benefit from certain uses of Facebook.

Facebook provides an ideal context for studying the rich-get-richer and social compensation hypotheses within a late adolescent and emerging adulthood population, given the popularity, accessibility, and diversity of this website. Because Facebook users have a wide variety of communication tools available to them, users with different characteristics can shape their Facebook experience in ways that are most personally advantageous. For example, users who are more socially skilled could use Facebook to strengthen pre-existing relationships by engaging in multiple methods of communication (e.g., Wall posts, Messages, Chat), by socializing through Applications such as interactive games, and by coordinating or attending Events. Conversely, users who are more socially isolated could use Facebook to increase the size of their social networks by finding and adding new Friends based on shared interests (e.g., Group memberships) and reconnecting with pre-existing friends with whom they have been close in the past. In addition, Facebook may enable introverted or less socially-skilled users to develop greater intimacy in their relationships, by allowing them to choose the mode of communication with which they are most comfortable. For example, a person who has trouble quickly coming up with appropriate responses in a conversation may prefer to interact with others using Facebook Chat because it is private but does not require an immediate response as do face-to-face or telephone conversations.

Researchers have provided important preliminary information on how and how much young adults are using Facebook (e.g., Pempek et al., 2009). Researchers have just recently begun to investigate how individual difference variables predict differences in the use of Facebook (e.g., Baker & Oswald, 2010). It is necessary to continue to go beyond the description of Facebook use to understand the variables that predict and explain the benefits or disadvantages that individuals with pre-existing strengths or

weaknesses derive from its use. One such variable that may predict different uses of social network sites like Facebook is attachment style.

Attachment

Attachment relationships are lasting emotional bonds initially developed between children and their caregivers (Bowlby, 1969). According to Bowlby (1969), human infants are biologically predisposed to engage in attachment behaviours -- attempts to promote and maintain visual and physical contact with their primary caregivers.

Attachment behaviours assist in survival, as they increase the likelihood that infants will have their needs for sustenance and protection met by the caregiver. Over the first year of life, infants develop an attachment bond with one or more caregivers, provided that the caregivers are minimally present and responsive. These bonds will not develop if infants are socially isolated or exposed to many caregivers for only short periods.

The nature of care that the developing child receives determines the quality of the attachment bond that develops. Ainsworth, Blehar, Waters, and Wall (1978) discussed two primary types of attachment bonds: secure and insecure. Secure attachments develop when caregivers are consistently responsive to their children's attachment behaviours. These caregivers are attuned to their infant's level of comfort or distress, and react accordingly. When the infant is distressed, the caregiver recognizes this discomfort and effectively consoles the infant. When the infant is content, the caregiver remains unobtrusive yet available. This allows the child to function independently while knowing that the caregiver is physically nearby and emotionally accessible should the child need him or her (Ainsworth et al., 1978).

Caregivers whose infants develop insecure attachments are typically less consistently available and/or responsive. Ainsworth and her colleagues (1978) identified

two types of insecure attachment: avoidant and anxious-ambivalent. Infants who demonstrate an avoidant attachment typically ignore their caregivers, do not show signs of distress upon separation, and tend to appear withdrawn and emotionally disengaged. Children who demonstrate an anxious-ambivalent attachment display both approach and avoidance behaviours toward their attachment figures. These children become distressed upon separation, but are not easily comforted by their caregivers' attempts to console them.

Through experiences with attachment figures in the first few years of life, children develop attachment relationships and form internal working models of self and others (e.g., Bowlby, 1969, 1973, 1980). These internal working models represent an extension of the attachment system developed in infancy, and they organize thoughts, behaviours, memory, and affect regarding interactions with others as children develop. Specifically, these cognitive schemas lead to expectations about the outcomes of social interactions, guide subsequent social behaviours, influence interpretations of ambiguous interactions with others, regulate affect in the presence of interpersonal stressors, and direct attention to and memory of social interactions in ways that are consistent with the individual's pre-established internal working models (e.g., Bartholomew & Horowitz, 1991; Bowlby, 1980; Collins, Guichard, Ford, & Feeney, 2004; Rholes & Simpson, 2004; see also Swann, 1987). The nature of these cognitive representations varies, depending on the caregiver's availability and responsiveness to the child's attachment behaviours during infancy and early childhood. A working model of self as worthy or unworthy of love and support, and working models of others as available and responsive or unavailable and detached are determined by the child's degree of success in getting his or her needs met by the attachment figure (Bowlby, 1969, 1973, 1980).

Because these working models guide future interactions with others, children tend to recreate their early attachment relationships with others by seeking out individuals who respond to them in ways similar to the responses of their primary caregivers and by behaving in ways that elicit familiar responses. Children's attachment styles are continually reinforced through this process, as well as by the selective processing of attachment-related experiences that are consistent with their internal working models. This pattern contributes to stability in attachment style as the child enters adolescence and adulthood (e.g., Fraley, 2002; Rholes & Simpson, 2004; Waters, Hamilton, & Weinfield, 2000). For example, Fraley (2002) conducted a meta-analysis of the available longitudinal studies of attachment security to investigate the extent to which internal working models remain constant over time. He found that attachment style classification (secure vs. insecure) remained moderately stable over time between the ages of 1 and 19 years. Furthermore, Fraley noted that analyses of the data supported a prototype model of attachment. This perspective posits that the basic internal working models formed in infancy remain relatively unchanged and continue to influence interpersonal interactions for the duration of an individual's life, although some modification to the later-developing and more cognitively-complex aspects of these models can occur with new experiences. Other authors have reported that attachment style stability also depends somewhat on the consistency of the family environment and on social interactions, especially over the first few years of life (e.g., Waters, Merrick, Treboux, Crowell, & Albersheim, 2000; see also Bretherton & Munholland, 1999 for a review).

Based on the assumptions of the prototype model, researchers have investigated whether Bowlby's (1969, 1973, 1980) theory might help to explain different kinds of attachment relationships in adulthood, such as attachment in romantic relationships

(Hazan & Shaver, 1987; Weiss, 1994). Bartholomew (1990) and Bartholomew and Horowitz (1991) described how Bowlby's internal working models of self and others could be used to create four prototypical attachment styles. First, each working model is dichotomized into positive and negative categories. The positive model of self holds that the self is deserving of care and affection, and indicates low dependence on others. The negative model of self holds that the self is unworthy and lacking, and thus these individuals are anxious and perceive that they must be dependent on others for continual acceptance in order to maintain a sense of self-worth. The positive model of others holds that others are accessible and dependable. Because these individuals perceive that they will be successful in meeting their needs through interaction with others, avoidance of others is low. Finally, the negative model of others holds that others are unavailable, untrustworthy, and unsympathetic. Because individuals who have a negative model of others perceive that they will be disappointed or rejected if they seek out others, their level of avoidance is high (see also Griffin & Bartholomew, 1994a).

Combining these positive and negative models of self and others results in one secure and three insecure adult attachment prototypes (Bartholomew, 1990; Bartholomew & Horowitz, 1991). The first prototype, secure, results from the combination of positive models of self and others. Adults with a secure attachment style believe that they are deserving of love and believe that others will be available and willing to provide care when needed. The second type, preoccupied (similar to Ainsworth's anxious-ambivalent style), results from the combination of a negative view of self and a positive view of others. Preoccupied adults believe that they are unworthy of love and thus they must seek out the approval of others to protect their fragile self-esteem. The third type, fearful-avoidant (hereafter referred to as fearful), results from the combination of a negative

model of self and a negative model of others. Adults who have a fearful attachment style believe that they are unworthy and that others will reject them if they seek out support or affection. To prevent this hurt and disappointment, fearful adults tend to avoid close relationships. Finally, the dismissive-avoidant type (hereafter referred to as dismissing) results from the combination of a positive model of self and a negative model of others. These individuals also avoid closeness with others, but they do so because they feel that the approval of others is not necessary to maintain their positive self-image (Bartholomew, 1990; Bartholomew & Horowitz, 1991). Bartholomew and Horowitz (1991) reported the following prevalence rates in their sample: secure (47%), dismissing (18%), preoccupied (14%), and fearful (21%). Other researchers also have reported an equal or nearly equal division between secure and the combination of the three insecure attachment types (e.g., Roberts, Gotlib, & Kassel, 1996; Seiffge-Krenke & Beyers, 2005).

In validating these four attachment prototypes, Bartholomew and Horowitz (1991) conducted a study to determine whether individuals with varying attachment styles would differ in expected ways in their self-concept and interpersonal interactions. In this study, undergraduate students, age 18 to 22 years, were interviewed and completed self-report measures of their self-concept, sociability, and interpersonal problems. In addition, each participant brought a friend who completed measures assessing the target participant's interpersonal problems and attachment styles. Results indicated that each attachment style correlated in expected ways with variables theorized to represent working models of self and other. For example, the secure attachment style was significantly positively correlated with self-confidence, warmth, and involvement in close relationships. This group demonstrated few interpersonal problems. For the dismissing attachment style, a pattern of results emerged suggesting high self-confidence and control, problems with hostility

and coldness, and low involvement in close relationships. For the preoccupied attachment style, an opposite pattern of results emerged, such that these individuals were rated as low in self-confidence and control and high in dependent behaviors in relationships. Finally, individuals with the fearful style were rated as significantly low on both self-confidence measures and measures of involvement with others, and had problems with assertiveness and expressiveness. In a replication study with 17- to 24-year-old participants, Bartholomew and Horowitz (1991) also found that for each of the four attachment styles, ratings of family and peer attachment were positively correlated (e.g., participants who rated higher on secure attachment to peers also rated higher on secure attachments in their family-of-origin). These results suggest that an individual's style of attachment to family members during late adolescence and early adulthood also extends to friendships.

It is important to note that a prototype represents an ideal or "pure" standard to which real people's characteristics can be compared (e.g., Horowitz, Wright, Lowenstein, & Parad, 1981). People do not always neatly fit into only one of the attachment categories, but rather tend to possess traits of each to differing degrees (Bartholomew & Horowitz, 1991). Therefore, researchers have emphasized the importance of dimensional approaches to conceptualizing attachment (e.g., Fraley & Waller, 1998; Kurdek, 2002). In fact, a 2006 review indicated that the vast majority of recent articles examining adult attachment used continuous or dimensional measures (Ross, McKim, & DiTommaso, 2006). Consistent with this approach, attachment prototypes also can be conceptualized as differing along two core dimensions: anxiety and avoidance (e.g., Brennan, Clark, & Shaver, 1998; Collins et al., 2004; Simpson, Rholes, & Nelligan, 1992). The secure and dismissing attachment styles reflect low anxiety. In other words, individuals low in attachment anxiety are not excessively worried that others will reject them and that this

rejection will negatively impact their self-image. In contrast, the preoccupied and fearful attachment styles reflect high anxiety. Individuals with high attachment anxiety worry that others will deny them of affection and reject or abandon them. How these individuals then relate to others varies based on the second dimension: avoidance. Secure individuals are low in avoidance, and thus seek out others to help meet their needs with the expectation that these interactions will be rewarding. Preoccupied individuals are also low in avoidance and frequently seek out others, but they do so for the purpose of reducing their high levels of anxiety. In contrast, fearful individuals are high in avoidance, given their distrust of others, and so do not seek out this compensation for their high anxiety, as do preoccupied individuals. Finally, dismissing individuals also are high in avoidance, as they perceive that others are both unreliable and unnecessary (e.g., Collins et al., 2004).

Researchers who utilize the dimensional approach to conceptualize attachment calculate scores on each dimension of attachment anxiety and attachment avoidance for each individual. Researchers can then compare the relations between these continuous scores and other variables of interest, such as coping strategies or adjustment outcomes. This dimensional approach was used in the present study. Individuals can be considered to be more securely attached if they are low in both attachment anxiety and attachment avoidance, and more insecurely attached if they are high in either or both of these problematic attachment characteristics.

Researchers have demonstrated that adult attachment styles have numerous implications for psychosocial well-being and distress. Researchers consistently report the most adaptive outcomes for those with more secure attachments. In comparison to those individuals who are higher in attachment anxiety and/or avoidance, individuals who are more securely attached tend to demonstrate greater life satisfaction (e.g., Pielage, Luteijn,

& Arrindell, 2005), better physical health (see Diamond & Hicks, 2004), and less loneliness and depression (e.g., Pielage et al., 2005; Simpson & Rholes, 2004; Wei, Russell, & Zakalik, 2005). Individuals who are securely attached also tend to be more socially competent than those who are insecurely attached. They demonstrate greater capacity for intimacy in both romantic relationships (e.g., Mayseless & Scharf, 2007; Pielage et al., 2005) and in friendships (e.g., Grabill & Kerns, 2000), better conflict resolution skills (e.g., Corcoran & Mallinckrodt, 2000; Pistole, 1989), and greater relationship satisfaction, overall (e.g., Jones & Cunningham, 1996; Pistole, 1989; Shi, 2003).

In contrast, individuals who are higher in attachment anxiety and/or attachment avoidance tend to have more negative outcomes, including higher levels of depression, anxiety, anger, and hopelessness (e.g., Mallinckrodt & Wei, 2005; Roberts et al., 1996; Wei, Heppner, & Mallinckrodt, 2003). For example, Mallinckrodt and Wei (2005) conducted a study with undergraduates to test whether insecure attachment in childhood leads to both social deficits and attachment anxiety/avoidance in adulthood, which in turn lead to low perceived social support and increased psychological distress. Their results indicated that greater attachment anxiety was significantly positively related to psychological distress, as well as indirectly related to increased distress and decreased perceived social support through negative relations with social self-efficacy and emotional awareness. Results also showed that greater attachment avoidance was significantly related to decreased perceived social support and increased distress, as well as indirectly related to these variables through decreased social self-efficacy and emotional awareness. The authors suggested that, through early experiences with caregivers, individuals who develop greater attachment anxiety and/or avoidance in

adulthood also have deficits in recognizing emotions in themselves, communicating their emotions to others, and forming close relationships. All of these deficits interfere with the acquisition of social support when needed and contribute to increased experience of psychological distress (Mallinckrodt & Wei, 2005).

In summary, differences in attachment developed through interactions with caregivers during infancy tend to remain relatively unchanged throughout adolescence and adulthood (e.g., Bowlby, 1969; Fraley, 2002). Bartholomew and Horowitz (1991) found support for four adult attachment styles -- secure, preoccupied, fearful, and dismissing -- that differ based on whether individuals hold positive or negative internal working models of the self and others. Since that time, researchers have found little empirical support for the existence of distinct attachment types; instead, they recommend using dimensional variables, such as attachment anxiety and attachment avoidance, to measure adult attachment (e.g., Fraley & Waller, 1998; Kurdek, 2002; Simpson et al., 1992). Following these recommendations, dimensional measures of attachment anxiety and attachment avoidance were used to measure attachment in this study. Greater attachment security (lower levels of attachment anxiety and avoidance) has been associated with a wide variety of positive outcomes for adolescents and adults (e.g., Pielage et al., 2005). In contrast, higher levels of attachment anxiety and/or avoidance have been related to poorer outcomes, such as decreased social support and increased psychological distress (e.g., Mallinckrodt & Wei, 2005). Attachment characteristics also have been demonstrated to extend beyond family relationships to both friendships (e.g., Bartholomew & Horowitz, 1991; Freeman & Brown, 2001) and romantic relationships (e.g., Hazan & Shaver, 1987). What remains to be investigated is whether these benefits and disadvantages for differences in attachment anxiety and avoidance extend to an

online setting. As online social interaction has become more popular and more normative (Gross, 2004), it stands to reason that these attachment style differences would extend to online peer relationships, as well.

Attachment and Internet Usage

Researchers have recently begun to examine how attachment-related variables may influence adolescents' and young adults' Internet usage. For example, studies have examined the role of attachment in preferred Internet uses and Internet dependence (Lei & Wu, 2007; Lin, Ko, & Wu, 2011; Mesch, 2001; Shin, Kim, & Jang, 2011; Siomos et al., 2012), in comparisons of online and offline friendships (Buote, Wood, & Pratt, 2009), in the quantity and quality of interactions in online relationships (Ye, 2007), in how students use social network sites (Hansen, 2008), and in jealousy and surveillance behaviors on Facebook (Marshall, Bejanyan, DiCastro, & Lee, 2012). These studies appeared to represent the only English-language published research examining the relation between attachment and Internet use. The limited research in this area, as well as the use of different measures of attachment by these researchers, has prohibited a comprehensive understanding of how attachment styles influence social network site usage and whether or not individuals benefit from this Internet use.

For example, Lei and Wu (2007) examined whether adolescents' attachment to fathers was related to their Internet use. The researchers examined preferred uses of the Internet (i.e., whether participants preferred to use the Internet for exchanging information, socializing, leisure, or business) and presence of pathological Internet use (a composite measure reflecting Internet addiction) in 712 students, age 11 to 19 years, in Beijing, China. They then compared these Internet usage patterns to the adolescents' self-reported trust in, communication with, and alienation from their fathers, as assessed by

the Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987). The results indicated that greater trust and communication with fathers was related to less problematic use of the Internet, whereas greater alienation from fathers was related to greater pathological Internet use. Interestingly, adolescents who reported greater strain in their relationships with their fathers also preferred to use the Internet for socializing. Lei and Wu suggested that adolescents may use the Internet to compensate for poor quality parent-child bonds by seeking out social interactions online. If this online socializing is perceived as rewarding, this could help explain why these adolescents developed greater pathological dependency on the Internet (Lei & Wu, 2007).

It is important to note that Lei and Wu (2007) examined characteristics of their participants' relationships with their fathers, rather than examining more traditional dimensional or categorical attachment styles. However, it seems likely that those adolescents who reported less trust and communication and more alienation in their relationships with their fathers would be higher in attachment anxiety and/or attachment avoidance. These findings suggest that adolescents who have insecure attachment characteristics would be more likely to use the Internet for socializing (e.g., through social network sites), and may be more likely to become dependent on the Internet than adolescents with secure attachment styles.

In contrast, Hansen (2008) used a more traditional four-category measure of attachment anxiety and avoidance (i.e., the Experiences in Close Relationships scale; Fraley, Waller, & Brennan, 2000) in her study on the role of attachment in undergraduates' use of social network sites. Her results indicated that attachment style was not significantly related to use of social network sites such as Facebook or MySpace. However, one limitation of this study was the unusual finding that no participants were

classified as securely attached. Of the participants with an insecure attachment style, 83% were classified as “anxious” (preoccupied), 14% were classified as “dismissive” (dismissing), and 3% were classified as “avoidant” (fearful). The lack of securely-attached participants, as well as limited variability and unequal group sizes, may have obscured any significant group differences.

Other studies have examined how attachment styles relate to online interactions and quality of online friendships using more balanced samples, although findings from these few studies have been mixed. For example, Buote and her colleagues (2009) examined whether undergraduate students’ attachment styles influenced their perceptions of the nature and quality of offline and online friendships. Participants (M age = 19.14 years; SD age = 1.94 years) completed self-report measures of their attachment styles and their current number of offline and online friends, as well as measures of various friendship characteristics for both offline and online friends, including friendship quality and satisfaction, intimacy, self-disclosure, and conflict resolution. Overall, their results indicated that individuals with secure attachments (i.e., those who were lower in both attachment anxiety and avoidance) reported having more friends and they reported greater self-disclosure and satisfaction with their offline than with their online friends. Somewhat different patterns were found for individuals with insecure attachments. For example, individuals with fearful attachment styles did not report significantly different levels of disclosure with offline and online friends, whereas individuals with dismissing and preoccupied attachment styles reported less self-disclosure with online friends. Individuals with preoccupied attachment styles did not report significant differences in their satisfaction with offline and online friends, whereas individuals with dismissing and fearful attachments reported significantly less satisfaction with their online friends.

Overall, these results suggest that individuals who have higher levels of attachment anxiety (i.e., those individuals with fearful or preoccupied attachment styles) may perceive fewer differences in the nature and quality of offline and online friendships than those who have lower levels of attachment anxiety (i.e., individuals with secure and dismissing attachment styles).

Ye (2007) also examined whether individuals' attachment styles were related to the quality of their online relationships. Participants ranging in age from 19 to 69 years old were asked to complete online measures assessing their attachment style classification (Relationship Questionnaire; Bartholomew & Horowitz, 1991), types of online relationships (casual, close friendship, or romantic relationship), satisfaction with these relationships, and breadth and depth of online interactions. Results revealed that for casual friendships only, individuals with secure and fearful attachment styles reported greater breadth and depth of interaction. In addition, a significant interaction between relationship type and attachment style was observed in that individuals with dismissing attachment styles reported the most satisfaction with casual friendships, followed by fearful and secure individuals. Individuals with preoccupied attachments were least satisfied with these informal relationships.

In contrast to these casual relationships, no significant attachment differences were found for the close friendships and romantic relationships. Interpreting these nonsignificant results, Ye (2007) suggested that when online relationships are more intimate, the nature of Internet communication (e.g., decreased physical proximity and nonverbal cues, as well as greater perceived similarity based on shared online interests) may compensate for any problematic attachment-related characteristics that might otherwise interfere with these types of close relationships (e.g., discomfort with intimacy

and self-disclosure). Ye recommended that future studies should explore the mechanisms by which attachment influences online social behaviour.

One possible explanation for these differences in relationship breadth, depth, and satisfaction is that individuals may feel more or less comfortable engaging in certain relationships online and offline as a function of the positivity or negativity of their working models of self and others. With offline relationships, researchers have demonstrated that individuals with different attachment styles vary in their willingness to self-disclose, trust, and develop intimacy, with results generally favouring those who have secure attachments and thus are low in both attachment anxiety and avoidance (e.g., Bauminger, Finzi-Dottan, Chason, & Har-Even, 2008; Cassidy, 2001; Grabill & Kerns, 2000; Mayseless & Scharf, 2007; Mikulincer, 1998; Mikulincer & Nachshon, 1991; Pielage et al., 2005; Pistole, 1993; Wei et al., 2005). For example, Grabill and Kerns (2000) conducted a study to explore the relation between attachment security and intimacy in offline friendships. Undergraduate students completed self-report measures of their attachment style (Relationship Questionnaire; Bartholomew & Horowitz, 1991) and three types of intimacy in friendships: self-disclosure, responsiveness (i.e., skill and interest in responding empathetically to others), and a composite variable consisting of perceived validation, understanding, and caring from others. The results indicated that individuals with secure attachments reported greater experience of each of the three intimacy variables. Surprisingly, the dismissing group scored higher on the composite variable; that is, these individuals reported greater feelings of being validated, understood, and cared for than the other two insecure groups. The authors suggested that this latter finding may be explained by the fact that individuals with dismissing attachment styles are less anxious and hold more positive models of self than do individuals with other

insecure attachment styles. Therefore, they do not need repeated explicit validation from others and thus are more likely to feel understood when given less attention and support, when compared to the other insecure attachment types.

Given these attachment-related differences in comfort and skill in promoting intimacy in offline friendships, individuals who have different levels of attachment anxiety and attachment avoidance also may benefit in different ways from using the Internet to foster relationships online. The rich-get-richer hypothesis (Kraut et al., 2002) would suggest that individuals who are more comfortable engaging in intimacy-promoting behaviours (i.e., those who are lower on both attachment anxiety and attachment avoidance) would translate these positive social skills to an online environment. These individuals may be more likely to seek and provide social support online and interact in ways that promote more intimate relationships. These more securely-attached individuals would thus be expected to develop closer and more rewarding relationships online, cope with their interpersonal problems online more effectively (e.g., through honest self-disclosure), and ultimately derive more psychosocial benefits. Research has tended to support the rich-get-richer hypothesis for variables such as willingness to communicate online (Ma & Leung, 2005; Sheldon, 2008) and quality of online relationships (Lee, 2009), variables that are likely to be products of individuals' attachment styles. This suggests that individuals who are "rich" in regard to attachment-related social skills would derive the most benefit from online social interactions.

In contrast, the social compensation hypothesis (Kraut et al., 2002) suggests that individuals who have fewer social skills offline (i.e., those who are higher in attachment anxiety and/or avoidance) would use the safer, more anonymous environment of the Internet to compensate for their deficits, decrease their social anxiety, establish new

relationships, or nurture pre-existing relationships in new ways. According to this perspective, securely-attached individuals may be less motivated to engage in online interactions because their offline relationships are satisfying. Instead, individuals who struggle to form close offline relationships because of attachment anxiety and/or avoidance would derive the most benefit from online social networking. Although there is less support for the social compensation hypothesis, these studies have rarely examined attachment, explicitly. Ye's (2007) study that found nonsignificant differences in close/romantic online relationships by attachment style may provide some preliminary evidence for a social compensation process. In interpreting these results, the author suggested that attachment differences in interaction and satisfaction may be less salient in more intimate online relationships, because the "characteristics of the online setting...can function as a leveler for different attachment styles" (p. 606). This interpretation is consistent with a social compensation model. That is, the characteristics of online communication may compensate for the interpersonal weaknesses of individuals high in attachment anxiety or avoidance, thus allowing securely- and insecurely-attached individuals to experience similarly close and satisfying relationships.

In summary, research suggests that attachment-related variables may influence how young adults use the Internet and social network sites. However, considerable methodological variability is present across these studies, as researchers have used different operational definitions of attachment and examined different uses of the Internet. Furthermore, these studies have produced conflicting findings. Some researchers have reported no differences in social network site usage by attachment style (Hansen, 2008), whereas others have reported greater pathological dependency on the Internet for those with insecure attachments (Lei & Wu, 2007; Shin et al., 2011; Siomos et al., 2011), less

distinction between offline and online friendships for individuals with higher attachment anxiety than for those with lower attachment anxiety (Buote et al., 2009), and greater breadth, depth, and satisfaction within casual online relationships for those with insecure attachments than is typically found in offline relationships (Ye, 2007). This lack of consensus precludes a comprehensive understanding of the role of attachment in how individuals use the Internet. In order to understand how attachment influences Internet use, we must examine variables that are theoretically expected to both derive from attachment style and determine whether individuals benefit from particular Internet uses.

One possibility is that attachment-related variables, such as comfort and skill in promoting intimacy, may determine how young adults use the Internet and social network sites when dealing with stressors. Perhaps individuals who are high in attachment anxiety and/or attachment avoidance use social network sites to cope with stressors in different ways than individuals who are low in attachment anxiety and/or avoidance. Whether the outcomes of this online coping are positive, negative, or neutral may vary based on whether a rich-get-richer or social compensation process occurs for individuals with different attachment styles. For example, it could be that individuals who are low in both attachment anxiety and attachment avoidance and who are “rich” with good offline coping skills and social support networks use the Internet for further adaptive coping choices. Or, it could be that individuals who are high in attachment anxiety and/or attachment avoidance and who have poor offline coping skills and few social support resources compensate for these offline weaknesses by using the Internet to cope more effectively. This study examined the relations between undergraduates’ self-reported attachment anxiety and avoidance and methods of interacting and coping online (e.g.,

seeking social support versus distraction) in order to test the rich-get-richer and social compensation hypotheses.

Coping

One way that attachment styles may influence how individuals use the Internet is through their effect on coping choices. Coping is defined as, “efforts to master, reduce, or tolerate the demands created by stress” (Weiten & Lloyd, 2003, p. 95). Numerous models of coping have been proposed, including the Ways of Coping model (Lazarus & Folkman, 1984) and the primary-secondary control model (Rothbaum, Weisz, & Snyder, 1982). These models propose that individuals attempt to cope with stressful experiences by either attempting to change the situation (problem-focused or primary control coping) or by attempting to adapt one’s emotions or behaviours to the situation as it stands (emotion-focused or secondary control coping). A third category (e.g., relinquished control; Rothbaum et al., 1982) is often used to refer to a lack of coping efforts. For example, individuals who are upset after arguments with their significant others may cope by apologizing in an attempt to rebuild the relationship (a problem-focused strategy), by watching a favourite movie to distract themselves and improve their mood (an emotion-focused strategy), or they may choose to ignore the problem and not engage in any strategies to solve the problem or reduce their distress (relinquished control).

Carver, Scheier, and Weintraub (1989) suggest that grouping these diverse strategies into only two overarching categories (problem- and emotion-focused) is overly simplistic, and masks important differences in coping outcomes. In their research, Carver and his colleagues assessed 15 types of dispositional coping strategies (coping strategies that people prefer to use across situations). They described these strategies as belonging to four broad categories based on whether the focus of the coping effort is on solving the

problem (problem-focused), managing an emotional response (emotion-focused), seeking support from others (support seeking), or engaging in strategies that are less adaptive and/or potentially harmful (maladaptive). This four-category model of coping will be used for the present study.

According to Carver and his colleagues (1989), the more problem-focused strategies include planning (e.g., brainstorming possible solutions), suppressing competing activities (avoiding distractions, such as TV and Internet, in order to focus on solving a problem), restraint (waiting until the time is right to act, rather than behaving impulsively), and active coping (enacting a solution). The coping strategies that are more emotion-focused include acceptance (e.g., accepting the situation as it stands), reinterpretation (looking for the good in the situation and/or focusing on what has been learned), humour (e.g., making jokes about the situation), use of religion (e.g., praying to a higher power for strength), and denial (e.g., pretending that the stressor never happened). Support-seeking strategies include instrumental and emotional social support seeking. Instrumental social support seeking refers to attempts to obtain concrete assistance or information from others in order to solve a problem, and thus is a more problem-focused strategy (e.g., a student who is worried about an upcoming test may ask a skilled friend to tutor her). Emotional social support seeking refers to attempts to obtain caring, understanding, or empathy from others in order to manage one's emotional reactions to stressors, and thus is a more emotion-focused strategy (e.g., the same student may phone a friend to discuss the exam in order to elicit supportive comments from the friend and thus decrease her own distress). Four additional coping strategies that are generally seen as more maladaptive include mental disengagement (e.g., daydreaming about different outcomes), behavioural disengagement (e.g., giving up on a goal), focus

on and venting of emotions (e.g., ruminating about feelings of anger), and substance use (using alcohol or drugs).

Individuals' coping choices have been associated with a variety of psychosocial adjustment variables. A review of studies on child and adolescent coping showed that adolescents' use of problem-focused and engagement coping strategies (strategies that involve engaging with a problem by seeking support, expressing emotions, and attempting to problem solve) was generally related to fewer internalizing problems (e.g., less depression and anxiety), fewer externalizing problems (e.g., less aggression and fewer behavioural problems), and greater academic and social competence (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). In contrast, emotion-focused and disengagement coping strategies (strategies that involve avoiding dealing with and thinking about the stressor, as well as social withdrawal) were generally related to greater internalizing and externalizing problems, as well as lower social and academic competence (Compas et al., 2001). Although this pattern of results suggests that dispositional preference for problem-focused coping is most adaptive, researchers have cautioned that whether strategies are adaptive in a given situation depends in part on the context and/or the stressor. Thus, both problem- and emotion-focused strategies can be adaptive, depending on the situation (e.g., Carver et al., 1989; Cheng, 2001, 2003; Forsythe & Compas, 1987; Lazarus & Folkman, 1984).

Researchers have found that a variety of adaptive coping strategies are related to positive outcomes in older adolescent and young adult populations, as well. Specifically, researchers have demonstrated that adaptive problem- and emotion-focused coping strategies, such as problem-solving and learning new skills, accepting and expressing emotions, and positive reinterpretation, as well as seeking social support, are related to

lower levels of loneliness (e.g., Donohue & Gullotta, 1983; McWhirter, Besett-Alesch, Horibata, & Gat, 2002; Rokach, 1990), lower levels of depression (e.g., Carbonell, Reinherz, & Beardslee, 2005; Kelly, Tyrka, Price, & Carpenter, 2008; Wilson, Pritchard, & Revalee, 2005), lower levels of anxiety (e.g., Griffith, Dubow, & Ippolito, 2000), and lower levels of general negative affect (Ben-Zur, 2009), as well as increased positive affect and life satisfaction (e.g., Suldo, Shaunessy, & Hardesty, 2008; Wilkinson, Walford, & Espnes, 2000; see Ben-Zur, 2009 for a review). For example, Suldo and her colleagues (2008) investigated whether coping choices were related to well-being and distress in 14- to 19-year-old high school students in an International Baccalaureate program (an advanced academic program for gifted students). Participants reported on their use of four types of coping strategies: family communication (speaking or interacting with parents for social support or assistance with problem solving), positive appraisal (re-framing the problem in a positive manner or engaging in pro-social activities), negative avoidance (avoiding thinking about the problem by engaging in inappropriate behaviours such as substance use), and anger (expressing negative emotions to others in a hostile manner). Participants also completed measures of their perceived stress, internalizing and externalizing symptoms, life satisfaction, and academic self-efficacy. Results indicated that coping using family communication was positively related to life satisfaction and academic self-efficacy, and negatively related to externalizing behaviour problems. Positive appraisal coping also was positively related to life satisfaction. The authors noted that engaging in the coping strategies of seeking support and thinking positively allowed these adolescents to cope more adaptively with the increased stress they experienced as a result of their advanced high school curriculum.

Similarly, Wilkinson and his colleagues (2000) found support for these associations in their investigation of the relations between coping styles and psychological distress and well-being. Secondary school and university students, age 16 to 25 years, completed self-report measures of their experience of negative events, coping styles, distress (anxiety and negative affect), and well-being (life satisfaction, happiness, and positive affect). Results indicated that approach coping (problem-focused coping strategies characterized by decreasing emotional involvement and rationally attempting to problem solve) was positively related to the composite measure of psychological well-being and negatively related to the composite measure of psychological distress.

On the other hand, maladaptive coping strategies such as avoidance (including mental and behavioural disengagement), denial, focusing on negative emotions, substance use, self-blame/self-injury, and engaging in socially-unacceptable behaviours (e.g., aggression or crime) have been shown to be related to greater loneliness (Rokach, 1990; Van Buskirk & Duke, 1991), depression (e.g., Wilson et al., 2005), anxiety (e.g., Griffith et al., 2000), and negative affect (e.g., Ben-Zur, 2009; Wilkinson et al., 2000), as well as decreased life satisfaction (Suldo et al., 2008) and decreased positive affect (Ben-Zur, 2009). For example, Suldo and her colleagues (2008) found that use of negative avoidance and anger coping was negatively related to life satisfaction and positively related to internalizing and externalizing behaviour problems. Similarly, Wilkinson and his colleagues (2000) found that more avoidant and emotion-focused coping strategies were related to increased distress and reduced well-being.

In summary, coping refers to the strategies in which individuals engage to manage stressful experiences. In general, research has demonstrated that problem-focused strategies that focus on directly addressing a problem, particularly one that is controllable,

are most adaptive, and are related to increased psychosocial well-being (e.g., Ben-Zur, 2009; Compas et al., 2001; Suldo et al., 2008; Wilkinson et al., 2000). Seeking instrumental and emotional social support are also important coping strategies that have been associated with positive outcomes, such as greater life satisfaction and decreased behaviour problems (Suldo et al., 2008), as well as greater perceived coping self-efficacy (e.g., Donohue & Gullotta, 1983; Griffith et al., 2000). On the other hand, studies have found that using strategies that either focus on or suppress negative emotions, without efforts to modify the stressor or the emotional experience (e.g., avoidance) are related to increased distress and behavioural problems, and decreased psychosocial well-being (e.g., Ben-Zur, 2009; Compas et al., 2001; Suldo et al., 2008; Wilkinson et al., 2000).

Researchers have suggested that in order to further the development of coping theory, future studies should investigate individual difference variables that may predict why individuals cope in certain ways and whether these coping efforts are adaptive for them (Griffith et al., 2000; Lopez, Mauricio, Gormly, Simko, & Berger, 2001; Wilson et al., 2005). Given that studies have demonstrated attachment style differences in domains such as life and relationship satisfaction and psychological distress (e.g., Pielage et al., 2005; Pistole, 1989), one possibility is that attachment predisposes individuals to cope with life stressors in certain ways. It may also be the case that attachment-related characteristics, such as preference for closeness with others versus independence, determine whether a given coping style is adaptive for an individual.

Attachment and Coping

The two attachment dimensions of attachment anxiety and attachment avoidance are based on combinations of positive or negative internal working models of self and others. Individuals may be more inclined to use certain types of coping strategies based

on their particular models of self and others. For example, those who have a positive model of self would have greater perceived self-efficacy, which may predispose these individuals to prefer using self-initiated problem-solving strategies to deal with stressors (e.g., problem-focused coping). In contrast, those who have a negative model of self may not engage in these self-directed strategies, and instead may engage in more avoidant coping strategies such as mental disengagement. Those who hold a positive model of others would perceive that others are available and trustworthy, and these individuals may be more likely to seek social support when coping with problems. In contrast, those who have a negative model of others would not be expected to rely on seeking social support as a preferred coping strategy. Instead, the strategies that these individuals prefer to use may depend on their model of self. That is, if they perceive the self as competent, they may engage in independent strategies that are problem-focused, and/or strategies that involve blaming others (e.g., aggression). If they perceive the self as inadequate, they may lack the confidence to engage in problem-focused coping strategies and instead use maladaptive coping strategies, such as mental or behavioural disengagement.

In fact, researchers have demonstrated that differences in coping are observed in adolescents and adults with different attachment styles, although these studies have not always specifically examined internal working models or attachment anxiety and avoidance. Secure attachment is typically related to more adaptive problem-focused, emotion-focused, and support-seeking strategies (e.g., Davis, Shaver, & Vernon, 2003; Greenberger & McLaughlin, 1998; Howard & Medway, 2004; Ognibene & Collins, 1998; Seiffge-Krenke, 2006; Seiffge-Krenke & Beyers, 2005), whereas those with insecure attachment styles are less likely to use these adaptive strategies and are more likely to use maladaptive emotion-focused coping strategies (e.g., Davis et al., 2003; Howard &

Medway, 2004; Landen & Wang, 2010; Larose & Bernier, 2001; Ognibene & Collins, 1998; Seiffge-Krenke, 2006; Seiffge-Krenke & Beyers, 2005).

For example, Howard and Medway (2004) examined the associations among 14- to 19-year-olds' attachment styles, experience of stress, and coping styles in response to hypothetical stressors. Specifically, they investigated whether secure, preoccupied, fearful, and dismissing attachment styles were related to four types of coping strategies: family communication (seeking support from parents to cope with stress), positive avoidance (avoiding thinking about the problem by engaging in positive behaviours such as exercise), negative avoidance (engaging in substance use to avoid stress), and anger (expressing negative emotions and/or aggression). Results indicated that greater security of attachment was positively related to coping using family communication and positive avoidance and negatively related to coping using negative avoidance. Conversely, ratings on all three of the insecure attachment styles were positively related to use of negative avoidance coping. In addition, fearful attachment was negatively related to positive avoidance coping. The authors also analyzed the relations between coping strategies and models of self and others. These analyses revealed that having a more positive model of self was related to greater family communication and decreased negative avoidance coping. Having a more positive model of others was related to increased family communication and positive avoidance, as well as decreased negative avoidance coping. Furthermore, they found that those individuals who had more positive models of self and others rated the perceived stressfulness of the hypothetical situations as lower than those with more negative models.

Seiffge-Krenke and Beyers (2005) expanded on these results by investigating whether there are changes over time in the relation between adolescents' attachment

styles and their usual coping choices in response to everyday stressors. Data were collected as part of a seven-year longitudinal study that began when the participants were 14 years old. Results indicated that securely-attached adolescents were most likely to use active coping strategies (defined as seeking support from others in order to solve problems) and internal coping strategies (such as brainstorming solutions to problems) at the study onset, as well as showing greater increases in the use of these strategies over the course of the study. In contrast, insecurely-attached adolescents were more likely to use withdrawal coping strategies, such as substance use and venting.

Similar results have been obtained in undergraduate populations. For example, Ognibene and Collins (1998) investigated whether undergraduate students' continuous ratings on each of the four attachment styles and models of self and others were related to perceived social support and their preference for using four types of coping strategies: seeking social support, confrontive coping (e.g., expressing anger toward the person who caused the problem), distancing (e.g., minimizing the seriousness of the situation), and escape-avoidance (e.g., fantasizing about the situation being resolved while doing nothing to improve it). Students rated how much they used each of these types of strategies in response to the most stressful event they had experienced in the past month and rated their likelihood of using each of these coping strategies in response to vignettes describing hypothetical achievement and social stressors. They also completed measures assessing their perceptions of the availability of social support from friends and family. As expected, perceived social support was positively correlated with secure attachment ratings and negatively correlated with fearful attachment ratings. With regard to coping, students who rated higher on secure attachment were more likely to seek social support when coping with both hypothetical and actual stressful situations. Further analyses

revealed that this relation was mediated by students' perceptions of available social support. Students who rated higher on preoccupied attachment were more likely to seek social support, engage in confrontive coping, and use escape-avoidance strategies. Students who rated higher on dismissing attachment were more likely to use distancing coping strategies and less likely to use confrontive coping in response to hypothetical stressful social situations. Finally, additional analyses revealed that negative models of self predicted greater use of escape-avoidance coping and positive models of others predicted greater use of social support seeking and confrontive coping.

Taken together, the results of these studies demonstrate that those with more secure attachments are more likely to engage in adaptive coping strategies (Howard & Medway, 2004; Ognibene & Collins, 1998; Seiffge-Krenke & Beyers, 2005). These individuals appear to be less overwhelmed by stressors (Howard & Medway, 2004), likely because their positive models of self and others lead them to believe that they will be capable of solving problems, on their own and/or with others' assistance. Seiffge-Krenke and Beyers (2005) alluded to the role of models of self and others when they noted that coping choices depend, in part, on individuals' attachment-related perceptions of self-worth, self-competence, and others' trustworthiness. In other words, positive models of the self and others enable individuals to believe that they are worthy of happiness (providing motivation to cope), are capable of solving their problems or changing their moods, and can trust others to provide assistance, thus increasing their use of adaptive problem-solving and support-seeking strategies (see also Seiffge-Krenke, 2006). These strategies are likely to have beneficial outcomes, which reinforces these positive coping choices. Furthermore, these positive internal working models contribute to low levels of both attachment anxiety and attachment avoidance, which could

otherwise interfere with efforts to seek support or engage in other adaptive coping strategies. In contrast, those who are higher in attachment anxiety and/or avoidance (and thus have more negative models of self and/or others) may be less confident that they will be able to solve their problems and/or doubt that others will be available for support when needed. Therefore, these individuals tend to choose self-focused coping strategies that are less adaptive, such as negative avoidance, withdrawal, and distancing (Howard & Medway, 2004; Ognibene & Collins, 1998; Seiffge-Krenke & Beyers, 2005).

In addition, researchers have demonstrated that these differences in coping mediate the association between attachment style and psychological distress (e.g., Birnbaum, Orr, Mikulincer, & Florian, 1997; Landen & Wang, 2010; Lopez et al., 2001; Turan, Osar, Turan, Ilkova, & Damci, 2003; Wei et al., 2003; Wei, Heppner, Russell, & Young, 2006). For example, Lopez and his colleagues (2001) investigated whether maladaptive coping mediated the relation between insecure attachment styles and psychological distress in undergraduate students. Participants completed self-report measures of attachment-related anxiety and avoidance, problematic coping styles of reactive coping (impulsive, emotion-based coping responses) and suppressive coping (coping responses that deny or avoid a problem), and current levels of psychological distress (a composite measure of depression and anxiety). Results indicated that the maladaptive coping styles of reactive and suppressive coping mediated the relation between attachment orientation (anxiety/avoidance) and the composite measure of psychological distress. The authors suggested that attachment-related anxiety and avoidance (characteristics of insecure attachment) may lead to increased levels of distress in young adults as a result of the predisposition for these individuals to use less effective forms of coping (such as avoiding or overreacting to the stress accompanying a problem),

rather than actively solving their problems or seeking others' support (see also Wei et al., 2003).

Wei and her colleagues (2006) extended this research to examine whether the relation between attachment and distress was mediated by ineffective coping styles in the context of a longitudinal study. Undergraduate students, age 18 to 26 years, completed measures of their attachment-related anxiety and avoidance at Time 1, and completed measures of their maladaptive perfectionism (i.e., their tendency to set unrealistically high standards and then experience disappointment when they do not attain their goals), their ineffective coping styles of reactive and suppressive coping, and their symptoms of depression at Time 1 and Time 2 (two months later). Results revealed that attachment anxiety and avoidance were related to future depression through two mechanisms. First, maladaptive perfectionism mediated the positive relation between insecure attachment (i.e., greater attachment anxiety/avoidance) and depression. Second, ineffective coping mediated the positive relation between maladaptive perfectionism and depression. Thus, it appeared that these students with insecure attachments were more likely to experience frustration in not attaining unrealistic personal standards. They then had difficulty adaptively coping with this frustration, which resulted in the increased experience of depression. The authors noted that, because attachment styles are relatively fixed, prevention and intervention efforts could be aimed at increasing adaptive coping choices in order to decrease depression in individuals with insecure attachments.

In sum, previous research has demonstrated that adult attachment styles are related to individuals' coping choices, and that these coping choices are related to individuals' well-being (Howard & Medway, 2004; Landen & Wang, 2010; Lopez et al., 2001; Ognibene & Collins, 1998; Seiffge-Krenke & Beyers, 2005; Wei et al., 2003; Wei

et al., 2006). In particular, secure attachment styles seem to be associated with greater use of adaptive problem-focused and support-seeking strategies (e.g., Ognibene & Collins, 1998; Seiffge-Krenke, 2006; Seiffge-Krenke & Beyers, 2005). These findings are consistent with the predictions of attachment theory, in that those individuals with more positive models of self and others (i.e., those individuals low in both attachment anxiety and avoidance) would be expected to have the confidence in themselves and others necessary to enact more active coping strategies (Seiffge-Krenke & Beyers, 2005). In contrast, negative working models of self and/or others (i.e., greater attachment anxiety and/or avoidance) seem to be related to greater use of negative emotion-focused and avoidant strategies, such as avoidance, substance use, distancing, and denial (Howard & Medway, 2004; Lopez et al., 2001; Ognibene & Collins, 1998; Seiffge-Krenke & Beyers, 2005). These maladaptive coping choices then contribute to the distress experienced by insecurely-attached individuals (Landen & Wang, 2010; Lopez et al., 2001; Wei et al., 2003; Wei et al., 2006). However, we do not yet know whether these associations among attachment, coping, and psychosocial adjustment are restricted to real-life environments, or whether these variables are related to each other in similar ways online.

Coping on the Internet

It is important to extend research on attachment and coping to an online setting, in part because young adults are regularly using the Internet for tasks formerly completed solely offline, such as communication and entertainment. The unique characteristics of the Internet create a context for coping that is qualitatively different than those contexts available offline. We do not yet know whether individuals engage in the same types of coping strategies online as they do offline or whether the various means of social communication and ways of accessing information that are unique to the Internet allow

adolescents and young adults to make more adaptive or less adaptive coping choices. For example, individuals may be more willing to seek information about sensitive problems (e.g., lack of knowledge about birth control) online due to the greater anonymity and control offered by the Internet. In addition, it may be easier for individuals who belong to a minority group (e.g., lesbian female or gay male youth) to seek social support online, given the greater opportunity afforded by the Internet to connect with supportive peers. We do not yet know how adult attachment styles might relate to coping choices in an online setting. Given the unique features of the Internet context, individuals with secure or insecure attachments may be better able to take advantage of these unique characteristics to cope more adaptively with their problems.

Researchers that have examined online coping typically have focused on the use of online support groups and health-related information seeking by those with medical issues such as HIV/AIDS (e.g., Reeves, 2001), cancer (e.g., Beaudoin & Tao, 2007), food allergies (e.g., Coulson & Knibb, 2007), infertility (e.g., Malik & Coulson, 2008), and eating disorders (e.g., Eichhorn, 2008). Far fewer studies have explicitly investigated online coping with everyday problems in normative samples (i.e., individuals without serious medical or mental health issues). It is important to investigate these “everyday” online coping choices in order to understand whether they benefit those with good offline coping skills (consistent with the rich-get-richer hypothesis) or assist those who lack adaptive offline coping skills (consistent with the social compensation hypothesis).

One of the few studies to investigate everyday coping on the Internet was a study that compared the online and offline coping choices of 14- to 23-year-old participants and examined how these strategies related to loneliness (Seepersad, 2004). Participants from across the United States completed online measures assessing their level of loneliness,

their offline coping, and their frequency and preferred types of Internet use. Offline coping strategies were grouped into four domains: rumination (dwelling on negative feelings of loneliness), passive-avoidant (engaging in passive behaviours such as watching TV while avoiding constructive actions to reduce loneliness), constructive-active (engaging in active behaviours such as exercising to improve mood), and emotion expression and social (speaking with others to solve the problem of loneliness). Seepersad defined a variety of online coping behaviours based on participants' preferred Internet uses. Specifically, using the Internet for entertainment was considered a form of avoidant coping, using the Internet for information seeking was defined as a means of engaging in active coping, and using the Internet for communication with others was considered a means for emotion expression and social coping. Findings revealed positive correlations between offline coping choices and the corresponding preferred Internet uses. As predicted, avoidant offline coping strategies such as rumination and passive avoidance were positively related to using the Internet for entertainment, and using the Internet for entertainment was positively related to loneliness. More active offline coping strategies such as attempting to solve the problem and seeking support were positively related to using the Internet to seek information. In addition, individuals who most often used support-focused types of coping strategies offline endorsed communication as one of the most important uses of the Internet. Seepersad suggested that using the Internet for entertainment provides another means for lonely adolescents and young adults to avoid dealing with their problems, whereas using the Internet for information or communication provides active copers with additional sources of information and support to help solve their problems (or manage their emotional reactions adaptively). Because participants tended to engage in online coping strategies that were similar to the coping strategies they

reported using offline, these results suggest that coping online is likely to benefit those who already use adaptive coping strategies in the real world. This interpretation is consistent with the rich-get-richer hypothesis.

With such a limited amount of research being conducted on Internet coping choices, it is not surprising that even fewer studies have examined the use of social network sites for coping, especially given that many of these sites only have become available recently. One exception is that of Baker and Moore (2008), who conducted a study to examine whether new users of the social network site MySpace differed in their levels of psychological distress and their preferred coping choices based on whether or not they intended to blog. A blog (weblog) is a form of online journaling (similar to Facebook Notes) in which an individual posts entries about any topic of personal interest (e.g., events of the day). Young adult participants ($M_{\text{age}} = 24.5$ years) completed online measures of their psychological distress, perceived social support, satisfaction with friends, and typical coping strategies. As predicted, those who intended to blog reported significantly higher depression, anxiety, and stress than those who did not intend to blog. Bloggers also were significantly less satisfied with their number of offline and online friends, and felt less socially integrated than non-bloggers. Finally, bloggers were more likely than non-bloggers to cope using self-blame and venting. The authors suggested that negative affect coupled with the perception of an insufficient support group provide the motivation for online blogging. These findings provide partial support for the social compensation hypothesis. That is, for those individuals who are unsatisfied with their current number of friends and their social integration, the Internet seems to provide a source of social compensation in that it allows them to share their distress with a larger online community and potentially increase their levels of social support. However, the

authors did not follow-up with their participants to determine whether this benefit was realized, and thus it was not certain whether the social compensation hypothesis was fully supported.

In contrast, Boniel-Nissim and Barak (2011) did investigate whether adolescents who were identified as having social-emotional difficulties benefited from blogging. The authors randomly assigned 14- to 17-year-old participants to one of six experimental conditions. Four of these conditions involved blogging and were created by combining the variables of blog topic (personal social-emotional difficulties or general topics) and whether the blog was open to comments from readers (open or closed). The other two non-blogging conditions were: (a) a group that typed a private diary on a personal computer, and (b) a no-writing control group. Participants in the five writing groups were asked to spend 20 minutes writing 200 to 800 words at least twice per week. As hypothesized, the authors found that participants who blogged about social-emotional difficulties, when compared to participants who wrote private diaries and participants in the control group, demonstrated significantly greater improvements in their self-esteem, quality of peer relationships, and level of social behaviors. In addition, participants whose blogs were open to comments from readers reported the most improvement compared with the other groups. These results persisted at a two-month follow up. Boniel-Nissim and Barak suggested that the anonymous interactions available online may allow individuals who feel socially rejected in offline interactions to decrease their negative self-perceptions and/or social anxiety, to create a new, more confident persona, and to interact with others as equals. This interpretation is consistent with the social compensation hypothesis.

Another study that examined coping on social network sites is Williams and Merten's (2009) study that investigated how adolescents use these sites to cope with the unexpected death of a peer.³ The authors used qualitative analyses to examine themes of the comments posted by adolescents on the profile page of a deceased peer. Analyses revealed that adolescents primarily used the profile page to direct their comments to the deceased individual. Coping themes in these comments included: emotion expression (depression, anger, and guilt), use of humour, information seeking, reminiscing and discussing current/future events, posting about the act of posting, and references to higher powers and an afterlife. The authors noted that research on offline coping has found that speaking to a deceased individual as a way of maintaining a relationship can be an adaptive coping strategy (Hadders, 2007). In support of this, the adolescents' comments also contained insight into why they perceived that posting on social network sites was an effective coping strategy. For example, one poster wrote, "...writing letters to people is something that people normally do. It feels more real. I can see it, I send it, I know that it's going someplace. And I feel like somewhere, you will read it" (Williams & Merten, 2009, p. 82). Given these findings, Williams and Merten concluded that social network sites have the potential to be a new, free, and readily available source for coping in which users may feel more comfortable expressing themselves freely than they would in a one-to-one discussion with a therapist or parent.

Sheldon and his colleagues (2011) provided an alternative explanation of why individuals may be motivated to use social network sites such as Facebook for coping.

³ Williams and Merten (2009) did not specify the name of the social network site they investigated in order to protect the identity of the deceased adolescents.

Specifically, the authors examined relatedness and connection with others as both a potential motivation for and potential outcome of Facebook use. They defined connection as having met needs for relatedness and as feeling close, connected, and intimate with important others. In contrast, disconnection was defined as having unmet needs for relatedness and as feeling lonely, unappreciated, or in conflict with important others. In a series of four studies, undergraduate psychology students completed self-report measures of Facebook usage, connection, and disconnection. In each of the four studies, the authors found that Facebook use was paradoxically positively correlated with both connection and disconnection. In the second study, the authors sought to explain this paradoxical finding by including three potential mediators, including a one-item measure assessing coping with loneliness by going on Facebook as well as variables assessing positive and negative social experiences within Facebook. The findings suggested that the relation between disconnection and Facebook use was mediated by using Facebook to cope. Results also demonstrated that the relation between Facebook use and connection was mediated by positive experiences of connection while using Facebook. In the third and fourth studies described within the same article, Sheldon and his colleagues used an experimental design to test what would happen when participants reduced or eliminated their Facebook use. Consistent with their hypotheses, the authors found that those who felt more disconnected initially were less willing and less successful in reducing their Facebook usage and demonstrated rebound effects (i.e., used Facebook even more than their baseline usage) when allowed to resume usage. The authors suggested that individuals who feel disconnected from important individuals in their life are motivated to increase their time on Facebook as a way of coping with this disconnection. This increased usage of Facebook, in turn, results in increased feelings of connection with

others (Sheldon et al., 2011). These results are consistent with a social compensation influence for individuals higher in disconnectedness. This unmet desire for connection may occur in some individuals who are higher in attachment anxiety and/or avoidance and thus do not have stable, secure attachment relationships with others.

A study by Mauri, Cipresso, Balgera, Villamira, and Riva (2011) provides additional insight into why individuals may use social network sites such as Facebook for coping. Mauri and his colleagues collected psychophysiological measures (e.g., skin conductance, heart rate, etc.) from 19- to 25-year-old participants while they engaged in each of three experimental conditions: a relaxation stimulus (a series of landscape photos presented for 9 seconds each), 3 minutes of free Facebook navigation time, and a stress stimulus (a 2-minute Stroop task and a 2-minute arithmetic task). Their findings demonstrated that Facebook use was associated with a distinct pattern of psychophysiological responses that differed from the responses to the relaxation and stress stimuli. More specifically, Facebook use was associated with both high arousal (e.g., increased activation of the sympathetic nervous system) and high positive valence (e.g., perception of positive feelings). The authors note that this pattern of results was consistent with a “core flow state,” which is a state of being wherein individuals are enjoying what they are doing (high positive valence) and are engaged in and being challenged by an activity (high arousal). Experiencing a core flow state is very rewarding and thus individuals are motivated to repeat this experience. Mauri and his colleagues suggest that these findings could explain part of the ever-increasing popularity of social network sites. These findings also may suggest a motivation for using Facebook for coping; that is, individuals experiencing low arousal (e.g., boredom) and/or high negative

affect (e.g., depression, anxiety, anger) may seek out Facebook if this has been successful in the past at changing the valence of their emotional and physiological states.

Taken together, these studies suggest that adolescents and young adults are likely to use similar coping strategies online as they do offline (e.g., Baker & Moore, 2008; Seepersad, 2004). With regard to who benefits from online coping, Seepersad (2004) found support for the rich-get-richer hypothesis in that those individuals who engaged in active coping and had supportive social networks in the real world seemed better able to utilize the Internet as another source of problem-solving. In contrast, other researchers have provided support for the social compensation hypothesis, as they have demonstrated that individuals who perceive low offline social support (Baker & Moore, 2008), who have social-emotional difficulties (Boniel-Nissim & Barak, 2011), and who feel disconnected from important others (Sheldon et al., 2011) appear to benefit from Internet use, such as blogging (Baker & Moore, 2008; Boniel-Nissim & Barak, 2011) and using Facebook (Sheldon et al., 2011). However, these researchers did not compare the outcomes of individuals who had pre-existing social difficulties to those with pre-existing social-emotional strengths. Because these researchers did not include individuals who had social strengths, they could not evaluate the rich-get-richer hypothesis and thus it is not clear if only social compensation effects are occurring online.

To the author's knowledge, with the exception of Sheldon and his colleagues' (2011) one-item measure of Facebook coping, no published studies have examined Facebook as a context for online coping. However, the study by Mauri and his colleagues (2011) provides some insight into *why* adolescents and young adults might use Facebook to cope; that is, it may increase their level of arousal and/or improve their emotional state. The study by Williams and Merten (2009) provides insight into *how* young adults might

use Facebook to cope with life stressors. They found that adolescents engaged in a variety of coping strategies on a social network site in response to the death of a peer. Given that many of the features of the social network site they described also would be available to Facebook users, their study demonstrates the potential value of Facebook as a new and important coping environment for adolescents and young adults. However, it is difficult to say whether their results support the rich-get-richer or the social compensation hypothesis because no additional information was gathered on the adolescents who posted the comments (e.g., offline social support or coping skills). It could be that the adolescents who cope in adaptive ways online are also those with good coping skills offline (rich-get-richer). Or, if these individuals felt uncomfortable in face-to-face discussions and were more likely to cope online, then the results would support the social compensation hypothesis. Another possibility is that individuals use social network sites such as Facebook differently based on their pre-existing attachment characteristics, and these characteristics may determine whether or not they benefit from their use of Facebook. Although researchers have demonstrated that attachment is related to coping choices and outcomes offline, to the author's knowledge, no studies have examined attachment as a predictor of online coping choices and associated adjustment outcomes. The present study addressed this gap by investigating the associations among attachment-related variables, offline coping, online coping, and psychosocial well-being and distress.

The Present Study: Overview and Contributions

The present study examined the associations among attachment styles, offline and online coping, and psychosocial adjustment in young adults. University students aged 17 to 25 years were asked to complete online questionnaires assessing their attachment styles, as well as their typical coping choices offline and online through Facebook.

Adjustment was assessed through online self-report measures of participants' current well-being (self-esteem, life satisfaction, purpose in life, and positive affect) and their current distress (negative affect, depression, anxiety, stress, and loneliness). A questionnaire assessing perceived social support from family, friends, and Facebook Friends also was obtained.

This study addressed several of the limitations and gaps in the literature on attachment, coping, and the Internet. First, it was an initial foray into the role of attachment in online coping. Although several studies have demonstrated that attachment-related variables influence coping choices offline (e.g., Howard & Medway, 2004; Ognibene & Collins, 1998; Seiffge-Krenke & Beyers, 2005), to the author's knowledge, there has not been any published research specifically investigating attachment influences on adolescents' or young adults' online coping choices. Given that Internet use has become a normative part of everyday life for North American youth (Greenfield & Yan, 2006), it is important to extend attachment theory to an online setting. The coping choices individuals make may be influenced by their attachment style. For example, individuals with secure attachment styles may prefer to cope online by seeking social support, whereas individuals who are high in attachment avoidance may prefer to use the Internet for distraction and therefore avoid actively coping with their problems.

Second, this study will specifically examine online coping choices made through Facebook, a tremendously popular social network site. Facebook provides an ideal context for studying online coping for several reasons. One reason is that Facebook offers users a wide variety of activities that cover the spectrum of possible coping choices. For example, Facebook members can use Wall Posts, private Messages, and/or Facebook Chat to seek instrumental or emotional social support. Conversely, Facebook members

can use Applications, such as games or trivia, for distraction or avoidance. Another reason is that Facebook offers both public and private methods of communication and coping. In other words, members can seek support through private Chat or Messages, or through public Wall postings or Status Updates. They can engage in distraction or problem-solving coping by viewing other users' posted content anonymously by "lurking" (i.e., leaving no record of their activity), or post publicly-visible content to their own or others' pages. They also have control over who can view any of their posted content by means of privacy settings. Finally, Facebook provides opportunities for users to engage in social support coping with both pre-existing and new social contacts because it allows individuals to add both offline contacts and complete strangers as Friends. Facebook also provides the opportunity for individuals to join Groups based on shared interests – a potential source of new Friends. Given the popularity, diversity, and accessibility of Facebook, it is important to understand how young people are using Facebook to cope with everyday life stressors, and how these online coping choices relate to their psychosocial adjustment.

Third, this study will compare participants' dispositional offline and online coping choices to see whether they are likely to use similar strategies in these two contexts when dealing with everyday stressors. Research on online coping has typically been limited to investigation of online support groups and information-seeking regarding serious medical and/or mental health issues (e.g., Reeves, 2001). Although these are important areas of research, the majority of adolescents and young adults are more likely to regularly encounter everyday stressors such as family conflicts, difficulties with peers, academic problems, and self/body image concerns that have a significant impact on psychological adjustment (Compas, Oroson, & Grant, 1993). Prior research suggests that individuals use

similar coping strategies online as they do offline (Baker & Moore, 2008; Leung, 2007; Seepersad, 2004); however, these researchers have used very different definitions of online coping, and none of them formally assessed a variety of potential online coping strategies. In addition, only one of these studies looked at everyday-type coping choices using a social network site (Baker & Moore, 2008). To the author's knowledge, no studies have examined Facebook as a context for coping with everyday stressors.

Finally, this study will further investigate the rich-get-richer and social compensation hypotheses of Internet use as they pertain to attachment and online coping. It did not appear that any published studies have examined these hypotheses when investigating attachment-related variables as predictors of online coping choices and associated adjustment outcomes. The present study will shed light on whether individuals with secure attachments benefit from the Facebook environment when coping with everyday stressors (rich-get-richer hypothesis), and/or whether features of the Internet can compensate for social weaknesses commonly experienced by individuals with insecure attachments and thus lead to more adaptive online coping choices for these insecurely-attached individuals (social compensation hypothesis).

Hypotheses

In the present study, adaptive coping was defined as the use of problem-focused, emotion-focused, and support-seeking coping strategies, whereas maladaptive coping was defined as the use of strategies such as denial, avoidance, and disengagement, all of which involve avoiding a problem rather than attempting to solve that problem or actively cope with a stressor. Research on offline coping has found that individuals who are low in both attachment anxiety and avoidance (i.e., individuals who are more securely attached) tend to make more adaptive coping choices than those with insecure attachment

characteristics, such as high attachment anxiety or attachment avoidance (e.g., Howard & Medway, 2004; Ognibene & Collins, 1998; Seiffge-Krenke & Beyers, 2005).

Furthermore, adaptive coping choices, such as problem-solving and seeking social support, are related to better adjustment outcomes, whereas less adaptive coping choices, such as avoidance, are associated with worse adjustment outcomes (Ben-Zur, 2009; Compas et al., 2001; Rokach, 1990; Suldo et al., 2008; Wilkinson et al., 2000). However, researchers have not yet examined whether attachment is a predictor of online coping choices and what psychosocial adjustment outcomes may be related to online coping.

Studies of online coping have found support for both the rich-get-richer hypothesis (Kraut et al., 2002; Lee, 2009; Seepersad, 2004) and the social compensation hypothesis (Baker & Moore, 2008; McKenna & Bargh, 1999; Ye, 2007); however, on the whole, there is greater support for the rich-get-richer hypothesis. Therefore, the main hypotheses of the current study were consistent with this perspective. The rich-get-richer hypothesis predicts that individuals low in attachment anxiety and avoidance (those who are securely attached) would use their adaptive offline coping skills in the context of the Internet and would derive greater benefit than those high in attachment anxiety and/or avoidance.

Alternative hypotheses consistent with the social compensation hypothesis also were considered in this study. The social compensation hypothesis predicts that individuals with social-emotional difficulties in the real world, such as those who have insecure attachments, may benefit from coping in an online environment. Given the social nature of Facebook and the characteristics of the two attachment dimensions, whether or not individuals make adaptive coping choices and benefit from online coping may depend on their levels of attachment anxiety and attachment avoidance. Individuals higher in

attachment anxiety desire satisfying relationships with others but often avoid the types of real-life interactions that would meet these needs due to fears of rejection (Collins et al., 2004). Therefore, they would be expected to compensate for their poor offline coping skills by making more adaptive coping choices online (e.g., by seeking social support from Facebook Friends) and derive more benefit from these adaptive choices in terms of increased well-being and decreased distress. In contrast, individuals higher in attachment avoidance distrust others and are disinterested in seeking support and pursuing social relationships (e.g., Collins et al., 2004). These individuals would not be expected to benefit from coping on a website that is inherently social. Instead, they may be expected to use Facebook for more maladaptive coping strategies such as cognitive or behavioural avoidance. If these individuals are not able to compensate for their poor offline coping choices by using more adaptive coping strategies online, then it is likely that they would fare the worst in terms of psychosocial outcomes.

It was expected that the relations between the attachment variables and each of the two adjustment outcome variables of well-being and distress would be mediated by individuals' offline and online coping choices. These associations were expected to be indirect because it was likely that individuals' levels of well-being and distress were not determined by their attachment style per se, but rather would be determined by their ability to cope with negative emotional experiences. The ability to cope with stressors, however, was likely to be determined by attachment-related characteristics. The following hypotheses were proposed for the present study:

Hypothesis 1: Attachment and coping.

Hypothesis 1a: Attachment anxiety and coping. Consistent with the rich-get-richer hypothesis, for both offline and online coping, those with higher levels of

attachment anxiety were expected to engage in less adaptive coping in both offline and online contexts. Therefore, if hypothesis 1a were supported, the following patterns of relations would be obtained:

Hypothesis 1a.i. Greater attachment anxiety would be related to less use of adaptive offline coping strategies.

Hypothesis 1a.ii. Greater attachment anxiety would be related to more use of maladaptive offline coping strategies.

Hypothesis 1a.iii. Greater attachment anxiety would be related to less use of adaptive online coping strategies.

Hypothesis 1a.iv. Greater attachment anxiety would be related to more use of maladaptive online coping strategies.

The alternative hypothesis 1a for online coping, based on the social compensation hypothesis, proposed that if individuals who tended to cope less adaptively offline were better able to cope adaptively online, the relation between individuals' levels of attachment anxiety and their reported use of adaptive online coping strategies would be positive. Thus, if the alternative hypothesis 1a were supported, the following patterns of relations would be obtained for online coping:

Alternative hypothesis 1a.iii. Greater attachment anxiety would be related to more use of adaptive online coping strategies.

Alternative hypothesis 1a.iv. Greater attachment anxiety would be related to less use of maladaptive online coping strategies.

Hypothesis 1b. Attachment avoidance and coping. Consistent with the rich-get-richer hypothesis, those with higher levels of attachment avoidance were expected to engage in less adaptive coping in both offline and online contexts. The alternative

hypothesis based on the social compensation hypothesis also was considered. In contrast to hypothesis 1a, the expected relations between individuals' levels of attachment avoidance and their online coping would likely be the same as those predicted by the rich-get-richer hypothesis because individuals who were higher in attachment avoidance were not expected to enact more adaptive coping strategies on a site that emphasizes social connections; instead, they were expected to become “poorer” by choosing maladaptive strategies in both contexts. Therefore, if hypothesis 1b were supported, the following patterns of relations would be obtained:

Hypothesis 1b.i. Greater attachment avoidance would be related to less use of adaptive offline coping strategies.

Hypothesis 1b.ii. Greater attachment avoidance would be related to more use of maladaptive offline coping strategies.

Hypothesis 1b.iii. Greater attachment avoidance would be related to less use of adaptive online coping strategies.

Hypothesis 1b.iv. Greater attachment avoidance would be related to more use of maladaptive online coping strategies.

Hypothesis 2: Coping and psychosocial adjustment. Higher levels of both offline and online adaptive coping were expected to be related to greater well-being and decreased distress, whereas more maladaptive coping in both contexts was expected to relate to decreased well-being and increased distress.

Hypothesis 3: Coping as a mediator between attachment and psychosocial adjustment.

Hypothesis 3a: Attachment anxiety, coping, and adjustment. Consistent with the rich-get-richer hypothesis, it was hypothesized that the more adaptive offline and online

coping choices of individuals who reported lower levels of attachment anxiety would mediate the association between their attachment anxiety and positive adjustment outcomes. Thus, if hypothesis 3a were supported, the following patterns of relations would be obtained:

Hypothesis 3a.i. Lower attachment anxiety would be related to greater use of adaptive offline coping, which in turn would be related to greater well-being and reduced distress.

Hypothesis 3a.ii. Lower attachment anxiety would be related to greater use of adaptive online coping, which in turn would be related to greater well-being and reduced distress.

As an alternative to this hypothesis for online coping, consistent with the social compensation hypothesis, it was hypothesized that the more adaptive online coping choices of individuals who reported greater attachment anxiety would mediate the association between their attachment anxiety and positive adjustment outcomes. Thus, if the alternative hypothesis 3a were supported, the following patterns of relations would be obtained:

Alternative hypothesis 3a.ii. Greater attachment anxiety would be related to greater use of adaptive online coping, which in turn would be related to greater well-being and reduced distress.

Hypothesis 3b: Attachment avoidance, coping, and adjustment. Consistent with the rich-get-richer hypothesis, it was hypothesized that the more adaptive offline and online coping choices of individuals who reported lower levels of attachment avoidance would mediate the association between their attachment avoidance and positive

adjustment outcomes. Thus, if hypothesis 3b were supported for attachment avoidance, the following pattern of relations would be obtained:

Hypothesis 3b.i. Lower attachment avoidance would be related to greater use of adaptive offline coping, which in turn would be related to greater well-being and reduced distress.

Hypothesis 3b.ii. Lower attachment avoidance would be related to greater use of adaptive online coping, which in turn would be related to greater well-being and reduced distress.

Hypothesis 4: Associations between offline and online coping. Consistent with the rich-get-richer hypothesis, individuals with pre-existing offline coping strengths were expected to enact similarly-beneficial strategies online, while minimizing their use of maladaptive strategies in both contexts. Thus, if hypothesis 4 were supported, the following pattern of relations would be obtained:

Hypothesis 4a. Greater use of adaptive coping strategies offline was expected to be related to greater use of adaptive coping strategies online.

Hypothesis 4b. Less use of maladaptive coping strategies offline would be related to less use of maladaptive coping strategies online.

An alternative hypothesis consistent with the social compensation hypothesis would predict that individuals would compensate for their offline shortcomings by choosing different coping strategies to enact online. Thus, if the alternate hypothesis 4 were supported, the following results would be observed:

Alternative hypothesis 4. The associations between offline and online coping strategies would be nonsignificant.

Hypothesis 5: Use of and attitudes toward Facebook as predictors of online coping. Recent studies have suggested that Facebook use increases feelings of connection with others (Sheldon et al., 2011) and results in a positive core flow state (Mauri et al., 2011). These rewarding experiences would be reinforcing and thus would be expected to increase the use of and positive attitudes toward Facebook. Research on offline coping has demonstrated that individuals are more likely to seek help (one type of adaptive coping) from a given source when they have more positive attitudes about and/or more contact with that source (e.g., Le Mare & Sohbat, 2002; Lopez, Melendez, Sauer, Berger, & Wyssman, 1998). Therefore, it was hypothesized that individuals who reported greater Facebook usage and more positive attitudes about Facebook would be expected to more frequently engage in adaptive online coping using Facebook, compared to individuals who were less frequent and enthusiastic Facebook users.

CHAPTER III

DESIGN AND METHODOLOGY

Participants

Undergraduate students between the ages of 17 and 25 years ($n = 296$) were recruited through the Department of Psychology Participant Pool system at a mid-sized university in southwestern Ontario. Only those students who indicated they were between the ages of 17 and 25 years and currently had a Facebook account were eligible to participate. Despite these requirements, one participant reported being 37 years of age and one participant responded that she did not have a Facebook account. These participants' data were excluded. Of the remaining 294 participants, 11 were excluded from the analyses because of incomplete data (e.g., at least one full questionnaire was missing). The final sample consisted of 283 participants (82% female, 17% male, < 1% transgender, < 1% "other").

Participants ranged in age from 17.75 to 25.58 years ($M = 20.92$ years, $SD = 1.69$ years). The majority of participants self-identified as Caucasian (76%), whereas the remainder self-identified as Asian/Pacific Islander (9%), African-American/Black (4%), Multiracial (3%), Latin American (< 1%), or "other" (8%). The distribution of year in university was as follows: 17% were in first year, 31% were in second year, 30% were in third year, 18% were in fourth year, 4% were in fifth year, and < 1% were in sixth year. Most participants were either single (47%) or in a dating relationship (47%), with the remainder of participants reporting that they were engaged (4%), married (1%), or in a common-law relationship (1%). With regard to living arrangements, 68% of participants reported living with parents. The remainder of participants reported living with non-romantic roommate(s) (21%), with a romantic partner (6%), or alone (5%).

The vast majority of participants reported having had Internet access for 6 or more years (92%), whereas the other participants reported having had Internet access for 3 to 5 years (7%), 1 to 2 years (< 1%), or less than six months (< 1%). All participants reported having an active Facebook account, with 88% of participants reporting that they had had their Facebook account for more than 2 years. The remaining participants reported having a Facebook account for 1 to 2 years (8%), 7 to 12 months (1%), or 2 to 6 months (3%). No participants reported having their Facebook account for fewer than two months.

Participants also provided information on their current use of Facebook, including time on Facebook per day, number of Friends, and use of various Facebook functions. The most commonly endorsed amount of time spent on Facebook per day was 1 to 2 hours (25%). The remaining participants reported the following amounts of time on Facebook per day: 3 or more hours (11%), 2 to 3 hours (12%), 31 to 60 minutes (24%), 11 to 30 minutes (17%), and 10 minutes or less (11%). Thirty-six percent of participants reported having more than 400 Facebook Friends. The remaining participants reported having 301 to 400 Friends (17%), 201 to 300 Friends (26%), 101 to 200 Friends (15%), and 11 to 100 Friends (6%). No participant reported having fewer than 11 Friends. A great deal of variability was present in participants' reported use of various Facebook functions, including number of photo albums posted on Facebook ($M = 17.65$, $SD = 35.00$, range: 0 to 375), number of Facebook groups to which they belonged ($M = 17.21$, $SD = 25.86$, range: 0 to 200), number of Facebook groups created ($M = 0.58$, $SD = 1.50$, range: 0 to 18), number of Facebook Events attended ($M = 15.17$, $SD = 18.21$, range: 0 to 100), number of Facebook Events created ($M = 2.65$, $SD = 5.43$, range: 0 to 50), and number of Notes posted ($M = 5.81$, $SD = 13.76$, range: 0 to 100).

Participants also provided information on their use of other social network sites. Analyses of these data revealed that Facebook was by far the most popular social network site among these users. The second most common site was Twitter (used by 18% of participants), followed by MySpace (10%), and Windows Live Spaces (8%). The remaining sites listed or provided by participants were endorsed by fewer than 2% of respondents. Eighty-eight percent of participants reported that they used Facebook exclusively or more than any other social network sites, with an additional 7% reporting that they used Facebook about as much as other social network sites. Only 3% of the sample reported using a different social network site more than Facebook. Taken together, these results indicated that most participants reported frequent and exclusive use of Facebook, with the majority of participants using Facebook for over 30 minutes each day (72%) and having over 200 Friends (79%). These findings supported the decision to investigate online coping choices on Facebook, rather than on any other social network site.

With regard to general uses of the Internet, 44% of participants reported that school-related activities represented their most important reason for using the Internet. Other uses chosen as most important included e-mail (16%), social network sites (11%), entertainment (9%), reference information (6%), work (5%), instant messaging (4%), news/weather/sports (2%), surfing (browsing Internet pages; 2%), and playing games (1%).

Students who participated in this study were given one bonus mark toward an eligible course of their choice. Participants were treated in accordance with the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans.

Measures

Participants completed 12 online questionnaires assessing demographics; the independent variables of Facebook attitudes and usage, attachment, offline coping, and online coping; the outcome variables of well-being and distress; and a measure of perceived social support, which was used in examining the validity of the measure of Facebook coping created for this study.

Demographics questionnaire. Participants completed a demographics questionnaire (see Appendix A) that included items relating to basic background characteristics (age, year in school, gender, and ethnicity), as well as variables that were potentially related to the target variables in the study (e.g., attachment and coping), including relationship status and living arrangements.

Facebook Questionnaire. Participants completed the Facebook Questionnaire to assess their attitudes toward and usage of Facebook. The first item inquired as to whether participants had a Facebook account. This item was a potential exclusion criterion because students were only eligible to participate if they had a Facebook account. The second item asked how long participants had maintained their Facebook account and was included to obtain background information on participants' duration of Facebook use.

The next 20 items of this questionnaire assessed participants' attitudes toward and usage of Facebook. Of these 20 items, the first eight were taken from Ellison and her colleagues' (2007) Facebook Intensity Scale. The first item assessed participants' frequency of Facebook use, with response options ranging from 0 (*less than 10 minutes/day*) to 5 (*more than 3 hours*). The second item inquired about participants' approximate number of Facebook Friends, with response options ranging from 0 (*10 or less*) to 8 (*more than 400*). Six items assessed participants' connection to and attitudes

toward Facebook (e.g., “Facebook has become part of my daily routine”). Participants responded to each of these six items on a 5-point Likert scale, with response options ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Consistent with the procedure used by Ellison and her colleagues, responses to these eight items were standardized by converting raw scores to z-scores and then averaged to create a Facebook usage and attitudes score. Ellison and her colleagues reported good internal consistency for this Facebook intensity of use scale ($\alpha = .83$). Data from this scale also demonstrated good internal consistency in the present study ($\alpha = .81$). These eight items were used to test hypothesis five, which stated that more positive attitudes toward Facebook and more frequent use of Facebook should be related to greater frequency of Facebook coping.

The latter 12 of the 20 items were derived from the research of Ross and his colleagues (e.g., Ross et al., 2009). In contrast to the items from the Facebook Intensity Scale that assess usage of and attitudes toward Facebook as a whole, these items inquired about participants’ frequency of use and attitudes toward the various features and applications of Facebook (e.g., “How many Facebook Groups do you belong to?”), as well as assessing participants’ relationships with their Facebook Friends (e.g., “What percentage of your Facebook Friends List have you met in person?”). Response options varied for each item and included multiple choice responses and open-ended responses for which participants input a number or word(s). These items were included to obtain additional descriptive information about participants’ use of Facebook.

Each of the five remaining items on the Facebook Questionnaire were analyzed separately to provide background information on participants’ use of other Internet functions and alternate social network sites. Three items were created for the present study. The first assessed how long participants had been using the Internet, with response

options ranging from 0 (*0 - 6 months*) to 5 (*6+ years*). The other two items compared participants' use of Facebook with their use of other social network sites. Specifically, participants first were presented with a list of seven popular social network sites, such as MySpace and Twitter, and were asked to indicate which of these sites they used in addition to Facebook. They also were asked to provide the names of any other social network sites to which they belonged that were not listed. In the next item, they were asked to choose one of three responses from a drop down menu indicating whether they used any of these alternate sites more, less, or as often as they used Facebook. The final two items on the questionnaire were Seepersad's (2004) Activity item and Important Use item that assessed participants' general use of the Internet. For each item, participants were presented with a list of 13 Internet activities, such as instant messaging, reference information, and playing games. For the Activity item, participants were asked to indicate whether or not they used the Internet to engage in that activity. For the Important Use item, participants were asked to choose which of the 13 activities they personally viewed as the most important use of the Internet.

Relationship Scales Questionnaire. Participants were asked to complete the Relationship Scales Questionnaire (RSQ; Griffin & Bartholomew, 1994b) to assess their attachment styles. The RSQ is a 30-item measure of attachment that assesses participants' models of self and others in regards to close relationships and has been widely used in attachment research (e.g., Kurdek, 2002; Ognibene & Collins, 1998). It was selected for this study, rather than other measures of attachment, because of its focus on general attachment orientations, rather than limiting measurement of attachment to romantic partners (e.g., The Experiences in Close Relationships-Revised Questionnaire; Fraley et al., 2000) or to parents (e.g., Adult Attachment Interview; e.g., Main, Hesse, & Goldwyn,

2008). Participants responded to each RSQ item on a 5-point Likert-type scale, with response options ranging from 1 (*not at all like me*) to 5 (*very much like me*).

Researchers have recommended calculating continuous scores on each attachment dimension rather than categorizing individuals into attachment style groups (e.g., Fraley & Waller, 1998; Kurdek, 2002; Ross et al., 2006). Consistent with this recommendation, continuous scores on each of two subscales were calculated using a subset of the items on the RSQ. Specifically, 13 items on the RSQ that were developed by Simpson and his colleagues (1992) and integrated into the creation of the RSQ by Griffin and Bartholomew (1994b) were utilized. The first subscale, attachment anxiety, contained five items and assessed the degree to which participants reported concerns about being rejected or unloved (e.g., “I worry about being abandoned”). The second subscale, attachment avoidance, contained eight items and assessed the extent to which participants reported refraining from developing intimacy and interdependence with others (e.g., “I find it difficult to trust others completely”). Responses within each scale were summed and averaged, such that higher scores on each subscale represented greater endorsement of attachment anxiety or attachment avoidance. Researchers have reported good reliability for the subscales of attachment anxiety and attachment avoidance (e.g., $\alpha = .83$ and $.77$, respectively; Kurdek, 2002). Data from both of these subscales demonstrated good reliability in the present study ($\alpha = .82$ and $.80$ for attachment anxiety and attachment avoidance, respectively). The attachment constructs measured by the RSQ also have demonstrated good convergent and predictive validity (Griffin & Bartholomew, 1994b; Kurdek, 2002; Simpson et al., 1992).

Perceived Social Support Scale. The Perceived Social Support Scale (PSS; Procidano & Heller, 1983) was used to assess participants’ perceived support from and

closeness to important individuals in their lives. This measure was included to examine the convergent and divergent validity of the Facebook COPE measure created for the present study. The PSS consists of two 20-item scales, one of which refers to perceived social support from friends (PSS-Fr; e.g., “My friends are sensitive to my personal needs”) and one that refers to perceived social support from family (PSS-Fa; e.g., “I rely on my family for emotional support”). An additional 20-item scale, perceived social support from Facebook Friends (PSS-Fb; e.g., “My Facebook Friends are good at helping me solve problems”) was created for use in this study. Items on this scale were identical to the PSS-Fa items, with the exception of the source of social support changed to “Facebook Friends.” Participants were instructed to respond to these items based on their perception of social support from the contacts on their Facebook Friends list. Because it was likely that participants also interacted with some or all of their Facebook Friends offline, they were instructed to respond to these items with regard to their interactions with these individuals through Facebook only. Procidano and Heller designed the original PSS scale with three response options (*yes*, *no*, and *don't know*). Ognibene and Collins (1998) modified these response options to a 5-point response scale, which was used in this study. Therefore, participants responded to each item on these three questionnaires on a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), following the procedure of Ognibene and Collins. Responses within each scale were summed and averaged, such that higher scores represented greater perceived social support from each source. The PSS has demonstrated good convergent and discriminant validity, as well as good test-retest reliability ($r = .83$ over 1 month; Procidano & Heller, 1983). Ognibene and Collins (1998) found very good internal consistency for the PSS-Fr ($\alpha = .89$) and PSS-Fa ($\alpha = .96$) subscales using the Likert response format. Data from the present study

demonstrated excellent reliability for PSS-Fr ($\alpha = .94$), PSS-Fa ($\alpha = .95$), and PSS-Fb ($\alpha = .92$).

COPE. The COPE (Carver et al., 1989) was used to assess participants' dispositional offline coping strategies (i.e., what they usually do when they encounter stressors in their everyday lives). Participants responded to the 60 COPE items on a 4-point Likert-type scale, with response options ranging from 1 (*I usually don't do this at all*) to 4 (*I usually do this a lot*). Following the COPE scoring outlined by Carver and his colleagues (1989), scores on each of the 15 COPE subscales were calculated by summing and then finding the mean of four COPE items. These subscales included planning, suppression of competing activities, restraint, active coping, acceptance, positive reinterpretation and growth, humor, use of religion, denial, instrumental social support seeking, emotional social support seeking, venting of emotions, mental disengagement, behavioral disengagement, and substance use. For the present study, these 15 coping subscales were grouped into one, three, and four coping categories (Carver et al., 1989; Litman, 2006), and confirmatory factor analysis was conducted to test these competing models and determine which factor structure best fit the data. The responses for items within each of the coping categories were averaged to create a score for each category. Higher scores within each category represented greater use of those types of coping strategies.

Carver and his colleagues (1989) demonstrated that the COPE has good convergent and discriminant validity. Furthermore, the subscales have shown good test-retest reliability (r_s ranged from .42 to .89 over 6 weeks), and the internal consistency for the subscales ranged from .45 to .92 (Carver et al.). In the present study, internal consistency for each of these subscales was generally good (all $\geq .72$), with the exception

of three subscales (suppression of competing activities, mental disengagement, and restraint). The reliability of the suppression of competing activities subscale was improved from $\alpha = .51$ to $\alpha = .62$ by deletion of item 15 (“I keep myself from getting distracted by other thoughts or activities”). This modified three-item subscale was retained for the remainder of the analyses. The remaining two subscales with lower reliabilities could not be improved through deletion of items and so the four-item subscales were retained for further analyses in order to maximize use of the available data. See Table 1 for descriptive statistics for the COPE subscales.

Facebook COPE. No pre-existing measures of Facebook coping could be found in the literature. Therefore, an online coping measure, the Facebook COPE, was developed to assess participants’ coping choices on Facebook. Because individuals may not view their activities on Facebook during times of stress as coping strategies, items were taken from pre-existing coping measures and modified to list specific ways of using Facebook that paralleled the items used to measure offline coping in this study. Twenty-eight COPE items that could be directly converted to Facebook coping options were developed, including items from the suppression of competing activities subscale (e.g., “I put aside Facebook in order to concentrate on the problem”), instrumental social support subscale (e.g., “I try to get advice from my Facebook Friends about what to do”), the emotional social support subscale (e.g., “I try to get emotional support from my Facebook Friends”), and the mental disengagement subscale (e.g., “I look at people’s pictures or videos on Facebook to think about the problem less”). Of these 28 items, four items were duplicated and included in the Facebook COPE with and without specific examples to provide participants with ideas about how a coping strategy could be used on Facebook. For example, the items, “I get upset and let my emotions out on Facebook” and, “I get

Table 1

Descriptive Statistics and Reliabilities for the 15 COPE Subscales

Subscale	<i>M</i>	<i>SD</i>	α
Positive reinterpretation and growth	2.91	0.67	.74
Acceptance	2.64	0.66	.72
Venting	2.63	0.77	.80
Humor	2.26	0.82	.88
Mental disengagement	2.52	0.59	.43
Behavioral disengagement	1.59	0.55	.74
Denial	1.47	0.53	.72
Substance use	1.40	0.67	.94
Instrumental social support seeking	2.82	0.71	.75
Emotional social support seeking	2.87	0.81	.87
Active	2.64	0.62	.73
Planning	2.74	0.70	.80
Restraint	2.24	0.57	.62
Suppression of competing activities	2.30	0.64	.62
Use of religion	1.98	1.01	.94

Note. $N = 282$. The α for the suppression of competing activities subscale represents the three-item subscale with item 15 removed.

upset and let my emotions out on Facebook (for example, posting how I feel in my Status Update)” both were included. This was done to examine whether participants would respond differently to items containing examples. The four items with examples were ultimately excluded from this measure given the superior performance of the parallel items without examples. COPE items that could not be converted to Facebook-specific coping options (e.g., “I look for something good in what is happening”) were not included in this measure.

In addition to the 28 items modified from the COPE, 29 items that reflected the COPE subscales were developed for this study to assess activities unique to Facebook that could be used as coping strategies, such as “I play games or use Applications on Facebook in order to think about the problem less” (to assess mental disengagement strategies on Facebook) and “I post what has happened in my Status Update, hoping someone will offer advice or assistance” (to assess instrumental social support seeking strategies on Facebook). These items were added to assess additional coping options available on Facebook that were not covered by the modified COPE items, and also to increase the number and variety of potential coping options in the coping categories. Three additional items that assessed aggression as a coping strategy (e.g., “I post information, comments, or photos on Facebook that make someone else look bad”) were developed given previous research demonstrating that use of this type of coping differs by attachment style (e.g., Ognibene & Collins, 1998).

Finally, five items were derived from the Coping subscale of the Internet Use Scales (Gordon, Juang, & Syed, 2007). These items were modified to refer to “Facebook” rather than “the Internet” (e.g., “I use the Internet to cope with personal problems” was

modified to read, “I use Facebook to cope with personal problems”). Gordon and her colleagues reported good internal consistency for this subscale ($\alpha = .81$).

In consultation with a research group specializing in computer-mediated communication, Facebook COPE items that were double-barreled, redundant, and/or vague were modified or deleted and additional items relating to specific Facebook applications (e.g., FarmVille) were added. Including the duplicate items, there were a total of 69 items in the Facebook COPE. Participants responded to items on a 4-point Likert-type scale, with response options ranging from 1 (*I usually don't do this at all*) to 4 (*I usually do this a lot*).

Because this was a new measure, exploratory factor analysis was conducted to determine the underlying factor structure. Based on this factor analysis, factor scores for each coping category were computed, with higher scores representing greater use of that type of coping. The results of this analysis, as well as subscale reliabilities and validation analyses, are presented in the results section.

Well-Being Measures. Participants' responses on measures of self-esteem, life satisfaction, purpose in life, and positive affect were used to assess psychological well-being. These four components of well-being frequently have been used as outcome variables in studies of Internet use, attachment, and coping (e.g., Ben-Zur, 2009; Kraut et al., 2002; Pielage et al., 2005; Wilkinson et al., 2000).

Rosenberg Self-Esteem Scale. The first well-being measure, the Rosenberg Self-Esteem Scale (Rosenberg, 1965) is a 10-item measure of global self-esteem. Participants were asked to respond to items (e.g., “I feel that I have a number of good qualities”) on a 4-point Likert-type scale, with response options ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Items were averaged in order to calculate an overall self-esteem score,

such that higher scores indicated greater self-esteem. This instrument has been widely used and has demonstrated good construct validity. This measure also has been found to have good to excellent internal consistency ($\alpha = .72$ to $.90$ across studies; Gray-Little, Williams, & Hancock, 1997; Robins, Hendin, & Trzesniewski, 2001). Data from this measure demonstrated excellent reliability in the present study ($\alpha = .90$).

Satisfaction with Life Scale. The second well-being measure was the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985). The SWLS is a five-item measure of global life satisfaction. Participants responded to items such as, “If I could live my life over, I would change almost nothing,” on a 7-point Likert-type scale, with response options ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). All items were averaged with higher scores representing greater life satisfaction. Diener and his colleagues (1985) have demonstrated that the SWLS has good convergent and discriminant validity, is reliable over time ($r = .82$ over two months), and has very good internal consistency ($\alpha = .87$). Data from this measure also demonstrated excellent reliability in the present study ($\alpha = .90$).

Purpose in Life Scale. The third well-being measure was the Purpose in Life scale, which is a subscale of Ryff’s (1989) Well-Being Scales. This scale was used to assess participants’ sense of meaning in life, as well as sense of directedness and goals for the future. The remaining subscales from Ryff’s measure were not employed given the overlap with the other, more commonly-used, measures of well-being presented here. The Purpose in Life scale contains 14 statements (e.g., “I enjoy making plans for the future and working to make them a reality”) to which participants responded on a 6-point Likert-type scale, with response options ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Ratings on each item were averaged, such that higher scores represented greater sense of

purpose in life. Ryff reported that the original 20-item Purpose in Life scale had very good internal consistency ($\alpha = .90$) and test-retest reliability ($r = .82$ over six weeks), as well as good construct validity. The 14-item version of this scale is now recommended to reduce the burden on participants while maintaining good reliability ($\alpha = .88$).

Furthermore, this shorter version also is highly correlated with the 20-item parent scale ($r = .98$; C. Ryff, personal communication, January 28, 2008). Data from this scale demonstrated very good reliability in the present study ($\alpha = .88$).

Positive and Negative Affect Schedule. The fourth well-being measure was the Positive Affect (PA) subscale of the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PA subscale consists of 10 one-word positive emotion descriptors (e.g., “Excited”). Consistent with the PANAS guidelines, participants were instructed to indicate the extent to which they generally felt each of the listed emotions in order to obtain an overall characterization of participants’ emotional experiences. Participants were asked to rate their experience of each emotion on a 5-point Likert-type scale from 1 (*not at all*) to 5 (*extremely*). The ratings on each item were averaged to create a total positive affect score, with higher scores representing greater positive affect. Watson and his colleagues (1988) reported that this subscale had very good internal consistency ($\alpha = .88$) and that students’ ratings were reliable over time ($r = .68$ over eight weeks) when participants were instructed to indicate the extent to which they generally felt each of the listed emotions. Watson and his colleagues also demonstrated that the entire PANAS has good convergent and discriminant validity, and correlates highly with more lengthy and comprehensive measures of affect. Data from this subscale demonstrated very good reliability in the present study ($\alpha = .89$).

Psychological Distress Measures. Participants were asked to complete three measures of psychological distress. These three measures assessed negative affect, depression, anxiety, stress, and loneliness. These components of psychological distress are frequently assessed by researchers who have investigated Internet use, attachment, and coping (e.g., Ben-Zur, 2009; Kraut et al., 2002; Pielage et al., 2005; Rokach, 1990; Wilkinson et al., 2000).

Positive and Negative Affect Schedule. The first distress measure was the Negative Affect (NA) subscale of the PANAS (Watson et al., 1988). As with the PA subscale, the NA subscale consists of 10 one-word descriptors of negative emotions (e.g., “Ashamed”). Participants were asked to rate the extent to which they generally felt each of the listed emotions on a 5-point Likert-type scale from 1 (*not at all*) to 5 (*extremely*). The ratings for the negative affect items were averaged, with higher scores representing greater experience of negative affect. The PANAS has good convergent and discriminant validity, and the NA subscale has demonstrated very good internal consistency ($\alpha = .87$) and test-retest reliability ($r = .71$ over eight weeks). Data from this subscale also demonstrated very good reliability in the present study ($\alpha = .85$).

Depression Anxiety Stress Scales. The second distress measure was the short form of the Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1995). The DASS-21 was given to assess participants’ symptoms of distress over the preceding week. The 21 items of the DASS-21 are divided into three 7-item subscales. Each subscale assesses a specific type of distress, including depression (e.g., “I couldn’t seem to experience any positive feeling at all”), anxiety (e.g., “I experienced trembling, for example, in the hands”), and stress (e.g., “I found it hard to wind down”). Participants were asked to respond to each item on a 4-point Likert-type scale, with response options

ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*). Items on each subscale were averaged to create subscale scores, with higher scores indicating greater experience of depression, anxiety, or stress. A total scale score was created by summing the subscale scores to provide an overall estimate of distress. This overall score was used in this study. The DASS-21 has demonstrated good convergent and discriminant validity, as well as very good to excellent internal consistency for both the total scale score ($\alpha = .93$), and the depression ($\alpha = .88$), anxiety ($\alpha = .82$), and stress ($\alpha = .90$) subscales (Crawford & Henry, 2003; Henry & Crawford, 2005; Lovibond & Lovibond, 1995). Data from the DASS Total score used in the present study demonstrated excellent reliability ($\alpha = .92$).

UCLA Loneliness Scale (Version 3). The third measure of distress was the UCLA Loneliness Scale (Version 3; Russell, 1996). This 20-item scale was designed to provide a global assessment of participants' loneliness. Participants answered each item (e.g., "How often do you feel alone?") on a 4-point Likert-type scale, with response options ranging from 1 (*never*) to 4 (*always*). Responses were averaged to create a total loneliness score, such that higher scores indicated greater loneliness. Russell (1996) demonstrated that the UCLA Loneliness Scale (Version 3) has very good internal consistency ($\alpha = .89$ to $.94$ across multiple samples) and test-retest reliability ($r = .73$ over a period of 12 months), as well as good convergent, construct, and discriminant validity. Data from this measure demonstrated excellent reliability in the present study ($\alpha = .94$).

Composite adjustment variables. A composite well-being score was created by standardizing participants' mean scores on each of the four well-being measures (positive affect, purpose in life, satisfaction with life, and self-esteem), summing the standardized z-scores, and dividing by four. A distress composite score was created by standardizing

the mean scores on each of the three distress measures (negative affect, DASS total, and loneliness), summing the standardized z-scores, and dividing by three.

Procedure

Participants were recruited through the Psychology Department Participant Pool. An advertisement describing the purpose and methodology of the study was posted on the Participant Pool website and individuals who were eligible and wished to participate signed up for the study online.

The questionnaires for the study were completed online through the study's website. Students who signed up for a time slot were able to view the instructions on how to complete the study and were given the address of the study's website. The first page displayed to participants was the consent form/letter of information (see Appendix B). After reading the information, participants indicated their consent to participate by clicking on the "I agree" button located at the bottom of the page. The next page assigned participants a personal access code and instructed participants to record their unique code. This code allowed participants to return to the study if they were disconnected and allowed tracking of participation for providing compensation for study participation. Following the personal access code page, the next pages contained the questionnaires presented in Appendices A through L. These questionnaires were presented in the same order as they are listed in the Appendices to ensure standardization across participants and to prevent responses on some measures (e.g., distress measures) from influencing other responses (e.g., coping or well-being measures). Upon completion of the last questionnaire, a page was displayed to participants thanking them for their participation, informing them that their bonus point credit would be available within 48 hours, and informing them when and where the results of the study would be available. The consent

form/letter of information again was displayed on this page and participants were reminded to print this form if they had not already done so. The final page of the study presented instructions to participants regarding Internet security. This page presented information regarding how to clear the Internet cache, how to remove sites from the browser history, and how to delete cookies from the hard drive. Based on pilot testing, it was estimated that the online questionnaires took participants approximately 45 minutes to one hour to complete. Participants received one bonus point that could be applied to an eligible Psychology course of their choice.

CHAPTER IV

RESULTS

Overview of Data Analyses

The analyses are divided into six sections. The first section describes the confirmatory factor analyses of the COPE data, which were conducted to determine the indicators for the offline coping latent variable. The second section describes the exploratory factor analysis of the Facebook COPE data, which was conducted to determine the indicators of the online coping latent variable. This section also presents analyses conducted to examine the convergent and discriminant validity of the new Facebook COPE measure. The third section presents descriptive statistics and internal consistency reliability coefficients for the indicators of the latent variables of attachment anxiety, attachment avoidance, offline coping, online coping, well-being, and distress. The fourth section describes the Structural Equation Modeling (SEM) approach used to test the hypotheses. This analysis contained two steps. The first step consisted of the analyses conducted to determine an appropriate measurement model for the indicators and latent variables. The second step consisted of the analyses of competing structural regression models, which specified particular relations among the latent variables and thus presented a test of hypotheses one through four. The fifth section addresses the issue of equivalent SEM models and presents a test of an alternative structural regression model that also could explain the observed covariances. The sixth and final section presents the results of additional analyses involving the Facebook COPE, which were used to examine whether participants who reported greater Facebook usage and more positive Facebook attitudes more frequently engaged in online coping using Facebook. This section also presents the results of analyses conducted to examine the relations

between each subtype of online coping with attachment, avoidant offline coping, well-being, and distress.

Confirmatory Factor Analysis of COPE Subscales

Data preparation. Prior to analysis, the 15 COPE subscales were examined for reliability and normality of distributions. See Table 1 for descriptive statistics and reliability coefficients for the COPE subscales. Next, the distributions of the 15 COPE subscales were examined for normality. Five subscales had problematic skewness and/or kurtosis. Two of these subscales, substance use and religion, had severely non-normal distributions, with severe positive skew. Square root, logarithmic, and inverse transformations failed to improve the distributions of these variables. Examination of participants' responses to these variables indicated that the majority of individuals chose the lowest response option ("I usually don't do this at all"). Given the lack of normality in the distributions of these variables together with the rarity of engaging in these types of strategies within this population, they were excluded from further analyses. Square root transformations of the data on the denial, behavioral disengagement, and emotional social support seeking subscales improved the kurtosis and skewness levels of these subscales and these transformed scores were used in subsequent analyses.

Analysis decisions. Using the remaining 13 subscales, three competing models were tested. The first, baseline model included only one general coping factor with all COPE subscales loading on this factor (Model 1a). The second and third models were based on the results of Litman (2006). Using exploratory factor analysis, Litman (2006) found support for a four-factor model of the COPE subscales in one study and found support for a three-factor model in a follow-up study. Model 1b includes Litman's three factors (factor 1 - self-sufficient coping; factor 2 - avoidance; factor 3 - socially-supported

coping). Model 1c includes Litman's four factors (factor 1 - self-sufficient/problem-focused coping; factor 2 - avoidance; factor 3 - socially-supported coping; factor 4 – self-sufficient/emotion-focused coping). In the present study, the subscale of humor was found to be problematic in both the three- and four-factor solutions (e.g., very low squared multiple correlations) and so this subscale was excluded from these models. The original models did not contain any cross-loadings (i.e., variables loading on more than one factor) or error covariances. Some cross-loadings and error covariances were suggested through evaluation of the modification indices, squared multiple correlations, and residuals. Therefore, cross-loadings and error covariances were added to the models created for the present study provided that they were a) consistent with coping theory, b) logical given the wording of subscale items, c) had significant parameter estimates when added to the model, and d) resulted in substantial improvement in model fit.

In the present study, the confirmatory factor analytic models were tested using AMOS version 18.0. The covariance matrix was analyzed and the default estimation method of Maximum Likelihood was used because the subscale variables all had approximately normal distributions (following the transformations of three subscales). The latent variables were scaled by fixing one of the factor loadings for each factor to 1. The choice of path to fix is arbitrary (e.g., Byrne, 2010), but researchers suggest that these paths are reported (e.g., Jackson, Gillaspay, & Purc-Stephenson, 2009). For the one factor model, the loading for positive reinterpretation and growth was set to 1. For the three-factor model, the loadings for planning (factor 1), mental disengagement (factor 2), and instrumental social support seeking (factor 3) were set to 1. For the four-factor model, the loadings for planning (factor 1), mental disengagement (factor 2), instrumental social

support seeking (factor 3), and positive reinterpretation and growth (factor 4) were set to 1.

Model evaluation. No irregularities (e.g., Heywood cases; convergence problems) were noted in the solutions described below. Following the recommendations of Jackson and his colleagues (2009), as well as Boomsma (2000), the following measures of model fit were examined: the χ^2 goodness-of-fit test statistic (with degrees of freedom and p value), the Root-Mean-Square Error of Approximation (RMSEA) and its 90% confidence interval (Steiger & Lind, 1980), the Incremental Fit Index (IFI; Bollen, 1989), and the comparative fit index (CFI; Bentler, 1990). For the goodness-of-fit χ^2 , p values ideally should be $> .05$. However, arguments have been made against relying solely on the χ^2 test as a test of model fit because this test assumes that there is a correct model in the population (it is rarely clear if this assumption is justifiable) and because the test penalizes any differences beyond perfection in model structure (which is rarely the standard in statistical analyses). Further, χ^2 values increase with sample size and model complexity (Kline, 2011). For these reasons, additional fit statistics were reported. For RMSEA, values of .06 or lower are considered to represent close fit (Hu & Bentler, 1999) and values up to .10 are considered to represent adequate or mediocre fit (Bentler, 1992; Byrne, 2001). For the IFI and CFI, Hu and Bentler (1999) recommended that values of .95 or higher be considered to represent excellent model fit and values of .90 to .94 be considered to represent adequate model fit.

The results from the three CFA models are reported in Table 2. Model 1a demonstrated poor fit. The χ^2 value obtained for this model was large and significant. This indicated that the model-predicted covariances were significantly different from the population covariances and thus the exact-fit hypothesis was rejected (Kline, 2011). The

Table 2

Confirmatory Factor Analysis Comparison of Three COPE Factor Structure Models

Model	χ^2	(df)	p	RMSEA	90% C.I.	CFI	IFI
Model 1a (one factor)	244.29	58	<.001	.11	(.09 - .12)	.85	.85
Model 1b (three factors)	82.39	44	<.001	.06	(.04 - .07)	.97	.97
Model 1c (four factors)	106.73	44	<.001	.07	(.05 - .09)	.95	.95

Note. RMSEA = Root-Mean-Square Error of Approximation; CFI = Comparative Fit Index; IFI = Incremental Fit Index.

CFI and IFI fit indices were all well below the suggested .95 criteria, and the RMSEA value and its 90% confidence interval were well above the .06 criteria. This model did not appear to represent a valid factor structure for the COPE data. Model 1b (three-factor model; see Figure 1) demonstrated good fit. Although the χ^2 value obtained for this model was significant, it was greatly reduced. The CFI and IFI values were above the recommended cut-off and the RMSEA value fell within the recommended range. Model 1c (four-factor model; see Figure 2) also represented a significant improvement in fit over the one-factor model, although the obtained values did not reveal an improvement in fit over Model 1b. These results suggested that Model 1b should be retained for subsequent analyses.

Previous authors also have found support for a three-factor model of the COPE subscales (e.g., Hasking & Oei, 2002; Landen & Wang, 2010; Litman, 2006). However, there are several reasons that the four-factor model should not be rejected outright. First, the distinction between problem- and emotion-focused coping is one that has been made in the coping literature (e.g., Carver et al., 1989; Lazarus & Folkman, 1984) and these types of coping strategies are combined into the first factor in the three-factor model. They remain separate in the four-factor model. Second, previous researchers also have found support for a four-factor model (Greer, 2007; Litman, 2006). Third, the sample size and unique characteristics of the sample used in this study (e.g., fairly low levels of distress) may have resulted in decreased power and thus slightly biased χ^2 and fit index estimates.

Because of this ambiguity, two sets of factor scores were calculated. For Model 1b, scores were calculated for each of the three factors (self-sufficient, avoidant, and socially-supported coping) by taking the average of the items that loaded on each factor.

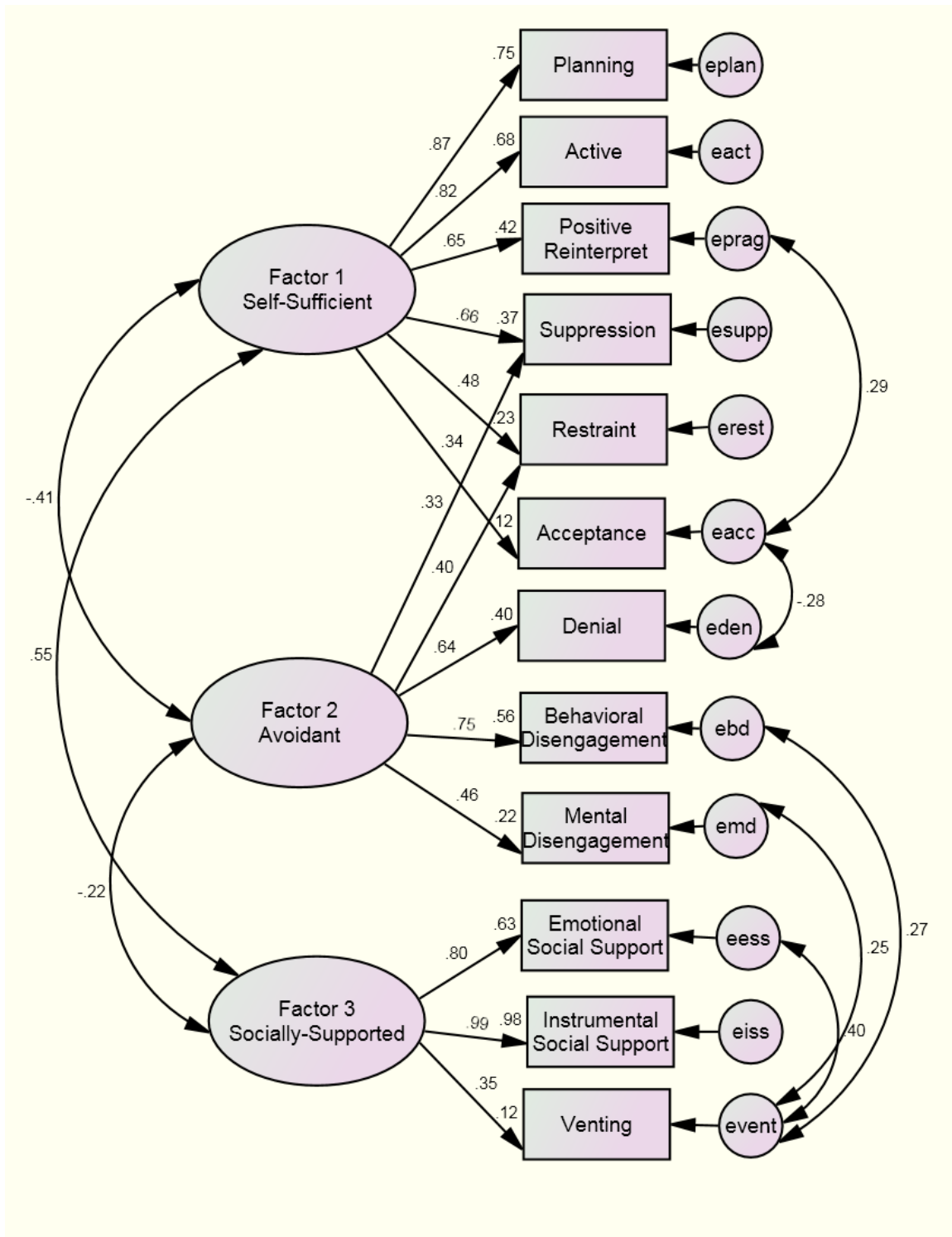


Figure 1. Final three-factor model of coping using 12 COPE subscales (Model 1b). The model includes standardized maximum likelihood parameter estimates.

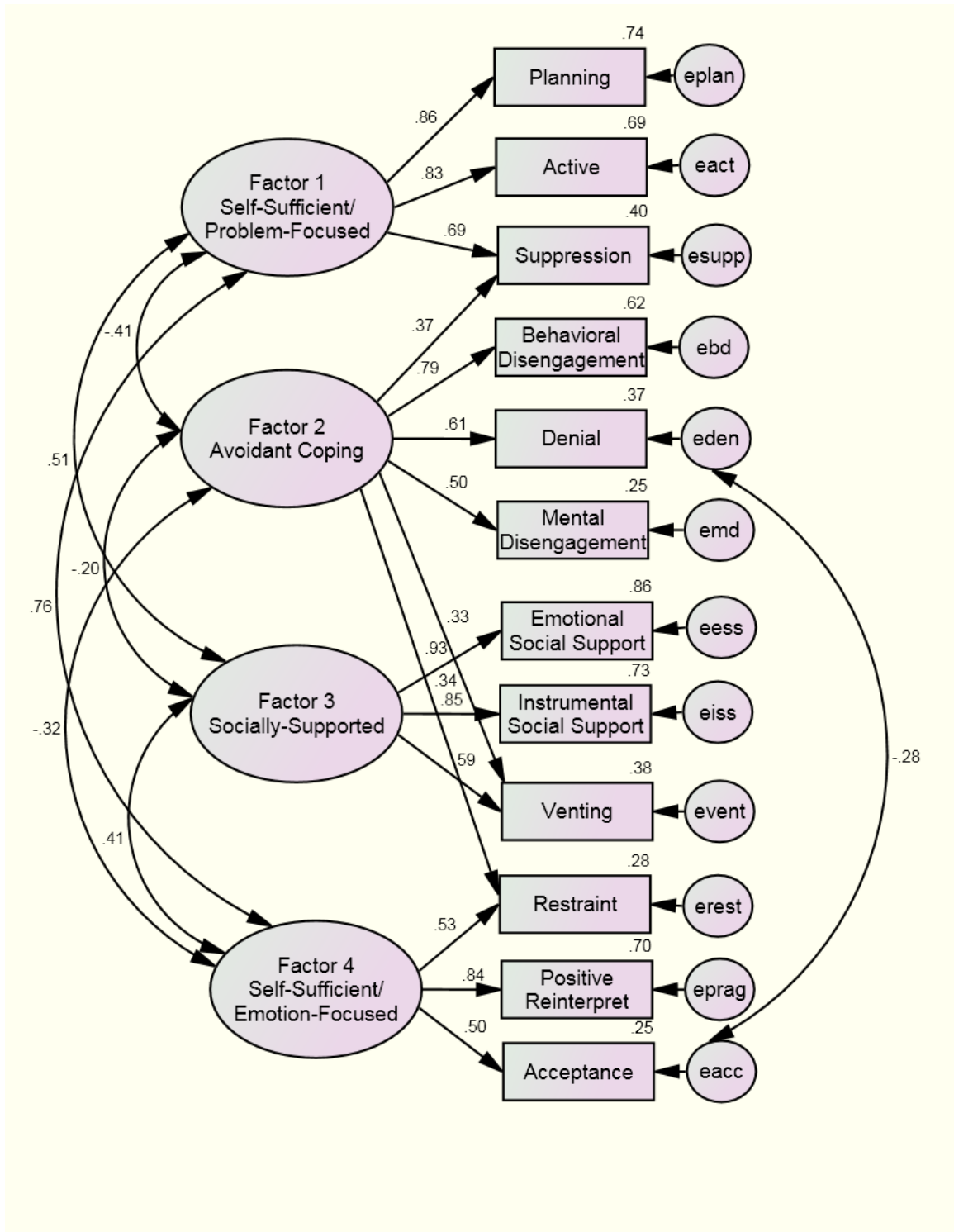


Figure 2. Final four-factor model of coping using 12 COPE subscales (Model 1c). The model includes standardized maximum likelihood parameter estimates.

For Model 1c, scores on each of the four factors (self-sufficient/problem-focused, avoidant, socially-supported, and self-sufficient/emotion-focused coping) were calculated in the same way. These factor scores were used as the indicators of the offline coping latent variable in the structural regression analyses that evaluated competing models (using the three- or four-factor model factor scores as indicators).

It is important to note that the avoidant factor demonstrated cross-loadings in both Model 1b and Model 1c. In the three-factor Model 1b, avoidant coping demonstrated cross-loadings with the restraint and suppression of competing activities subscales. These cross-loadings also were present in Model 1c, with an additional cross-loading with the venting subscale. Subscale means and reliability coefficients were calculated for the avoidant factor with and without these cross-loadings. The reliability of the avoidant factor was low ($\alpha = .54$) with the cross-loadings included and was improved to .64 when limited to the subscales unique to the avoidant coping factor (denial, mental disengagement, and behavioural disengagement). Given this improvement in reliability as well as possible problems with multicollinearity of indicators if subscales were used to calculate more than one indicator of the same latent variable, the avoidant coping variable calculated with only the three unique subscales was retained for further analyses.

In summary, confirmatory factor analyses of the COPE subscales were conducted to determine the number and structure of factors to use as indicators of an offline coping latent variable in subsequent analyses. The results provided support for both three- and four-factor solutions. Factor scores were calculated for the socially-supported coping factor (containing the COPE subscales of emotional social support, instrumental social support, and venting), the avoidant coping factor (containing the COPE subscales of denial, mental disengagement, and behavioural disengagement) and the self-sufficient

coping factor (containing the problem-focused COPE subscales of planning, active coping, and suppression of competing activities and the emotion-focused COPE subscales of positive reinterpretation, acceptance, and restraint combined in Model 1b but calculated as separate factors in Model 1c). These factor scores were used as indicators of the offline coping latent variable in subsequent analyses. Next, exploratory factor analysis was conducted on data from the Facebook COPE in order to determine reliable and valid indicators of the online coping latent variable in the structural regression analyses to follow.

Exploratory Factor Analysis of the Facebook COPE

In order to determine the dimensions that underlie undergraduate students' online coping choices via Facebook, an exploratory factor analysis (EFA) was conducted on the 69 items from the Facebook COPE.

Preliminary analyses. The assumptions of EFA were assessed to ensure the appropriateness of this method of data analyses. Examination of histograms indicated that most of the Facebook COPE variables had significant positive skewness; however, EFA is fairly robust to deviations from univariate normality and so analyses proceeded. The KMO statistic indicated that the sampling adequacy was good ($KMO = .92$), which is well above the suggested cut-off of .6 (Tabachnick & Fidell, 2001). This suggests that the correlations were compact and that any factors produced from the factor analysis should be distinct and reliable.

To assess multivariate normality, Mahalanobis' Distance was calculated for all cases. Forty cases with scores that exceeded the cut-off ($\chi^2(69) = 111.06, p < .001$) were identified as likely multivariate outliers. Examination of the responses of outlying cases revealed that these cases more highly endorsed coping options on Facebook. Deletion of

these cases would have further increased the skewness of the variables and greatly decreased the variability present in the data. Based on these reasons, all cases were retained for subsequent analyses.

To determine if there were any outliers among variables, the correlation matrix for all 69 variables was examined. Item 4 (“I act as though the problem hasn't even happened by not mentioning it on Facebook”; derived from the denial subscale) and item 24 (“I try hard to prevent Facebook from interfering with my efforts at dealing with the problem”; derived from the suppression of competing activities subscale) had very low correlations with most of the other variables and so these items were excluded from subsequent analyses. The correlation matrix also was examined to assess the assumption of the factorability of R (i.e., whether correlations were present among the items such that factor analysis would be likely to produce linear combinations of variables as factors; Tabachnick & Fidell, 2001). Because numerous correlations were greater than .30, and some were much higher, this assumption was met. Finally, no correlations greater than .90 were observed in the correlation matrix, which supports the absence of multicollinearity and singularity in the data.

Decisions and analyses. Exploratory factor analysis was chosen to analyze the data because the focus of interest was a theoretical solution about the underlying structure of online Facebook coping. Furthermore, EFA is said to be useful in the early stages of research, by helping make the data set more parsimonious (by having fewer variables) and assisting in hypothesis generation about underlying constructs. Given that online coping is a relatively recent area of study and this was the first investigation of the Facebook COPE, EFA was employed. PASW Statistics 18.0 was used to analyze the correlation matrix and the Maximum Likelihood method was used to extract factors.

Based on the recommendation of Tabachnick and Fidell (2001), several methods were used to estimate the number of factors to retain. Thirteen factors had eigenvalues greater than one, the cut-off suggested by Kaiser (1960). Given the very low increase in percentage of variance explained beyond the first few factors, this method likely overestimated the number of factors required. A scree plot also was examined, which indicated that six factors should be retained. Given these contrasting results and because this was the first examination of this scale, solutions with differing numbers of factors were tried to ensure that the factor solution would be adequate. Solutions with four, five, six, and seven factors were forced. The minimum of four factors was chosen based on the hypothesized four-factor structure of the data. The maximum of seven factors was chosen to examine whether the solution would continue to improve beyond the six factors suggested by the scree plot. Overall, the six-factor solution appeared to be the best (i.e., factor loadings were the most differentiated across factors in this solution) and was the clearest to interpret; thus, six factors were initially retained.

To assist in interpretation, the solution was rotated. Oblique rotation was chosen because the factors were correlated. Both Direct Oblimin and Promax rotation were applied to the solution; the Promax rotation made the solution the most easily interpretable. Similarly, a variety of values for kappa were tried and the value of 4 provided the most easily interpretable solution.

The communalities (the amount of variance of each item that is accounted for by all six factors) as well as the pattern matrix (the loadings of each item on each factor after rotation) are presented in Table 3. Overall, communalities ranged from low (.29) to high (.79). This indicated that differing amounts of variance in each variable were accounted for by the factor solution. The factor correlation matrix is presented in Table 4. Given that

Table 3

Communalities and Factor Loadings (Pattern Matrix) of Facebook COPE Items

#	Item	Communality	Factor					
			1	2	3	4	5	6
44	I post a Status Update that says I accept that the problem has happened and that it can't be changed.	.63	.87	-.16	-.03	-.00	.04	.03
45	On Facebook, I specifically name the person who caused the problem.	.56	.77	-.10	-.03	.02	-.07	.05
39	I post prayers or religious quotes in my Facebook Status Update or Notes.	.44	.77	-.04	-.03	-.19	.16	-.04
58	I use religious Applications to cope with stressful events.	.38	.74	-.07	-.02	-.14	.11	-.11
47	I post information, comments, or photos on Facebook that make someone else look bad.	.52	.74	-.11	.00	.10	-.09	-.03
55	I search Group pages for information to help me solve a problem.	.40	.71	.02	-.04	-.03	.01	-.14
40	I search on Facebook for information or ideas about how to solve the problem.	.56	.70	.09	.18	-.03	.02	-.21
37	I post a Status Update that directly asks for sympathy and understanding about the stressful experience.	.58	.70	-.08	.01	-.14	.00	.27
21	I use Facebook to make a plan of action.	.52	.68	.06	.07	.07	-.01	-.15
43	I directly ask for sympathy/understanding by posting something about the stressful experience on one or more of my Facebook Friends' Walls.	.53	.65	.10	-.08	-.09	-.05	.16
51	I make mean comments toward the person who caused the problem, through their Wall, photos, Private Messages, or Chat.	.50	.63	.06	-.05	-.02	-.08	.13
36	I post a Status Update directly asking for help with the problem (e.g., asking for information to learn more about the situation or solve the problem).	.49	.62	.10	-.12	-.05	.06	.15

7	I post Status Updates saying that I've given up trying to reach my goal.	.48	.56	-.12	-.00	.04	-.03	.28
5	I dedicate my time on Facebook to doing something about the problem.	.41	.56	.15	-.02	-.04	.09	.00
57	I post what has happened on one or more of my Friends' Walls, hoping they will offer me sympathy and understanding.	.48	.55	.18	-.09	.01	-.07	.11
52	I post what has happened in my Status Update, hoping someone will offer advice or assistance.	.54	.55	-.02	.04	-.06	-.06	.31
42	I directly ask for help by posting about the problem on the Walls of my Facebook Friends (e.g., asking for information to learn more about the situation or solve the problem).	.46	.52	.18	.08	.04	-.02	-.04
26	I use Facebook to come up with a strategy about what to do.	.48	.51	.16	.07	.11	-.07	-.04
15	I take direct action on Facebook to try to get rid of the problem.	.46	.50	.18	-.02	.19	-.10	-.12
56	I post what has happened on one or more of my Friends' Walls, hoping they will offer advice or assistance.	.48	.49	.23	-.00	.08	-.10	.00
22	I post Status Updates saying that I've given up the attempt to get what I want.	.52	.49	-.10	-.10	.17	-.11	.32
53	I post what has happened in my Status Update, hoping someone will offer me sympathy and understanding.	.52	.48	.03	.03	-.07	.00	.35
18	I pretend that the problem hasn't really happened by posting Status Updates that make it seem that everything is okay.	.38	.45	-.12	.27	.05	.15	.06

8	I look at people's Profile pages on Facebook to see if others have found good things about the same type of situation.	.40	.42	.20	.33	-.12	-.01	-.20
28	I post Status Updates saying that I am going to learn something from the bad experience.	.37	.41	-.10	-.04	.12	.11	.28
10	<i>I keep myself from getting distracted by Facebook (I avoid Facebook).</i>	.29	.41	-.10	-.29	.04	.30	-.24
11	I use Facebook to help me see the situation in a different light, to make it seem more positive.	.45	.38	.26	.09	.18	-.08	-.13
35	<i>I give up and use Applications on Facebook instead of trying to solve the problem.</i>	.31	.35	-.08	.31	.14	.04	-.06
59	I tell one or more of my Facebook Friends what has happened through Private Messages or Facebook Chat, hoping they will offer advice or assistance.	.65	-.17	.88	.01	.03	-.01	.00
33	Through Facebook, I talk to someone about how I feel.	.70	-.01	.85	-.14	.06	-.02	.07
9	I talk to my Facebook Friends online to find out more about the situation.	.65	.01	.84	-.03	.00	-.00	-.06
6	I discuss my feelings with someone through Facebook.	.64	-.14	.83	.06	-.10	-.00	.10
49	I directly ask one or more of my Facebook Friends for help through Private Messages or Facebook Chat (e.g., asking for information to learn more about the situation or solve the problem).	.57	-.14	.78	.10	-.01	.07	-.07
13	I try to get emotional support from my Facebook Friends.	.66	.09	.77	-.05	.04	-.03	-.01
60	I tell one or more of my Facebook Friends what has happened through Private Messages or Facebook Chat, hoping that they will offer me sympathy and understanding.	.59	.06	.73	-.05	.02	.02	.04

17	I talk to one of my Facebook Friends who could do something concrete about the problem.	.58	.06	.71	-.11	.02	.09	.09
29	Through Facebook, I ask my Friends who have had similar experiences what they did.	.60	.19	.71	-.04	-.06	.03	-.01
19	I get sympathy/understanding from someone through Facebook.	.63	.08	.70	.01	-.04	-.02	.11
3	I try to get advice from my Facebook Friends about what to do.	.52	-.02	.66	.03	.05	-.05	.06
50	I directly ask for sympathy and understanding about a stressor through Private Messages or Facebook Chat.	.41	.16	.61	-.02	-.12	-.01	.00
62	<i>I talk to my Facebook Friends online to find out more about the situation (e.g., I try to find out how many of my Facebook Friends also scored poorly on an exam).</i>	.58	.07	.52	.15	.11	-.00	.07
27	I use Facebook way too much to lose myself for awhile when I'm facing a problem.	.70	.07	-.15	.87	-.09	.00	.07
46	I spend more time on Facebook than usual to avoid thinking about the problem.	.62	.01	-.10	.84	-.02	-.01	.02
25	I look at people's pictures or videos on Facebook to think about the problem less.	.56	-.08	.08	.76	-.06	.11	-.10
14	I reduce the amount of effort I'm putting into solving the problem by spending more time on Facebook.	.54	-.10	.02	.72	-.03	-.03	.00
69	I distract myself from school stress by using Facebook.	.52	-.10	.03	.71	-.01	.07	.06
1	I spend time on Facebook to take my mind off things	.51	-.17	.07	.66	-.01	.02	.17
20	I spend too many hours on Facebook to help me get through the problem.	.58	.20	-.04	.63	-.03	-.07	.13

67	I use Facebook to get information about something that's hard to talk about with other people.	.42	.24	.13	.42	.10	-.04	-.15
41	<i>I play games or use Applications on Facebook (e.g., FarmVille, Mafia Wars, quizzes) in order to think about the problem less.</i>	.35	.38	-.12	.39	.12	-.03	-.10
65	I use Facebook to cope with personal problems.	.57	.35	.11	.38	-.06	-.06	.16
66	I use Facebook to feel like I am close to others.	.40	-.12	.01	-.06	.93	.02	.15
23	I kid around about the situation on Facebook.	.79	-.12	.01	-.06	.93	.02	.07
31	I make fun of the situation through Facebook.	.76	.05	-.07	-.04	.87	.05	.04
63	<i>I kid around about the situation on Facebook (e.g., make jokes or sarcastic comments about it in my Status Update, or kid around about it on someone's Wall).</i>	.65	-.08	.04	.02	.82	.04	-.03
12	I make jokes about the problem on Facebook.	.72	.12	.00	-.08	.79	.05	.05
34	<i>I put aside Facebook in order to concentrate on the problem.</i>	.58	.27	.03	-.36	-.09	.69	.04
54	<i>I decrease my time on Facebook in order to put more time and effort into solving my problem.</i>	.53	.21	-.01	-.26	.04	.67	-.03
32	<i>I avoid doing anything on Facebook that would make the problem worse.</i>	.52	-.27	.07	.21	.03	.66	.05
48	<i>I try to prevent Facebook from making problems worse.</i>	.47	-.14	.04	.25	.01	.63	.09
64	<i>I avoid doing anything on Facebook that would make the problem worse, such as posting a Status Update when I'm angry about the problem.</i>	.46	-.16	-.06	.19	.14	.63	.06
38	<i>I force myself to wait for the right time to do something about the problem on Facebook (e.g., not posting a Status Update about the problem until I have all the information).</i>	.29	.06	.09	.25	.09	.36	-.08
2	I get upset and let my emotions out on Facebook.	.63	.13	.04	.05	-.01	-.02	.68

<i>61 I get upset and let my emotions out on Facebook</i>	.66	.21	.03	.03	.10	.03	.61
<i>(e.g., posting how I feel in my Status Update).</i>							
16 I let my feelings out on Facebook.	.70	.26	.11	.01	-.00	.02	.60
68 I use Facebook to express myself.	.42	-.13	.24	.10	.03	.14	.50
30 I feel a lot of emotional distress and find myself							
expressing those feelings a lot on Facebook.	.52	.37	.00	.06	.05	.03	.41

Note. Items in italics were ultimately deleted from the scale. Extraction Method: Maximum Likelihood.

Rotation: Promax.

Table 4

Factor Correlation Matrix Resulting from the Facebook COPE Exploratory Factor Analysis

Factor	1	2	3	4	5	6
1 Self-Sufficient Online	--	.57	.40	.50	.02	.49
2 Direct Support Seeking		--	.56	.49	.12	.46
3 Distraction/Avoidance			--	.37	.03	.37
4 Humour				--	.14	.34
5 Avoidance of Facebook					--	-.12
6 Venting						--

Extraction Method: Maximum Likelihood. Rotation Method: Promax.

there were several factor correlations greater than .32, it was apparent that the factors were not orthogonal and thus the use of oblique rotation was supported. Based on the recommendation of Tabachnick and Fidell (2001), items were considered interpretable if they demonstrated a factor loading greater than .32; in fact, all items met this criterion.

Interpretation. Examination of the items on the first factor revealed that the common basis for these items was that all were self-directed coping strategies aimed at solving the problem or regulating emotions. As such, the structure of this factor paralleled the first (self-sufficient) coping factor obtained in the COPE analyses. Therefore, the first factor, self-sufficient online coping, included items that were designed to measure the COPE domains of acceptance (e.g., “I post a Status Update that says I accept that the problem has happened and cannot be changed”), positive reinterpretation (e.g., “I post Status Updates saying that I am going to learn something from the bad experience”), religion (e.g., “I post prayers or religious quotes in my Facebook Status Update or in Notes”), planning (e.g., “I use Facebook to make a plan of action”), and active coping (e.g., “I search on Facebook for information or ideas about how to solve the problem”). Items assessing coping strategies that involved more relational aggression (e.g., “I make mean comments toward the person who caused the problem through their Wall, photos, Private Messages, or Chat”) also loaded on this first factor. These strategies were originally conceptualized as being maladaptive and thus were expected to load on a “maladaptive coping” factor. However, these strategies also appeared to represent self-directed attempts at actively doing something on Facebook to cope (either to solve a problem or to change one’s emotional experience) and thus were consistent with the other self-sufficient coping items. In addition, these items were compared to the items that did

load on the factor that was conceptualized as being more maladaptive (factor 3 – distraction/avoidance) to examine where these items better seemed to fit. This review revealed that the aggressive strategies that loaded on factor 1, which involved self-directed attempts to do something about a problem (albeit in a way that likely was maladaptive), represented a fundamentally different process than that captured by factor 3, which involved avoiding any physical or mental reminders of the problem. Therefore, these items were retained on the first factor. Some items that were designed to measure support seeking (e.g., “I post a Status Update that directly asks for sympathy and understanding about the stressful experience”; “I post what has happened on my Friends’ Walls, hoping they will offer advice or assistance”) also loaded on this first factor, rather than on the second direct support seeking factor as expected. Because all of these items involved either Status Updates or posting on Walls, rather than directly contacting a Friend, they were consistent with being more self-sufficient strategies (i.e., they could be used without requiring a response from another person) and thus all of these items were retained for factor 1. Overall, the self-sufficient online coping items included both emotion-focused strategies (e.g., “I look at people’s Profile pages on Facebook to see if others have found good things about the same type of situation”) and problem-focused strategies (e.g., “I dedicate my time on Facebook to doing something about the problem”).

Two items were excluded from this factor. The item with the lowest loading (.35; “I give up and use Applications on Facebook instead of trying to solve the problem”) appeared to fit better, conceptually, with the Distraction/Avoidance factor and in fact loaded nearly as highly on this third factor (.31). Because of this problematic double-loading, this item was excluded from subsequent analyses. One additional item (“I keep

myself from getting distracted by Facebook (I avoid Facebook)”) demonstrated similar loadings across several variables and conceptually fit better with the fifth factor (Avoidance of Facebook). This item also was excluded due to these problems. The final self-sufficient online coping subscale contained 26 retained items.

The second factor, direct support seeking, included 12 items that referred explicitly to seeking conversation, discussion, and/or private communication with Facebook Friends as a coping strategy. These included the more general items derived from the support seeking items on the COPE that did not refer to a specific mode of communication on Facebook (e.g., “Through Facebook, I talk to someone about how I feel”), as well as items referring to support seeking through Private Messages or Facebook Chat (e.g., “I tell one or more of my Facebook Friends what has happened through Private Messages or Facebook Chat, hoping they will offer advice or assistance”). Both of these latter methods of communication involve one-to-one, private communication. The direct support-seeking coping items included both emotion-focused strategies (e.g., “I get sympathy and understanding from someone through Facebook”) and problem-focused strategies (e.g., “I talk to one of my Facebook Friends who could do something about the problem”).

The third factor, distraction/avoidance, included items that reflected the use of Facebook to avoid dealing with a problem or to provide a source of distraction from negative emotions. The items that loaded on this factor were derived from the domains of behavioural disengagement (e.g., “I look at people’s pictures or videos on Facebook to think about the problem less”) and mental disengagement (e.g., “I spend time on Facebook to take my mind off things”). Another item referring to the use of Applications (“I use Applications on Facebook to think about the problem less”) was problematic (.39

loading on factor 3 versus .38 loading on factor 1) and so was excluded from subsequent analyses, resulting in nine retained distraction/avoidance items.

The fourth factor, humour, included four items that specifically referred to making fun of the situation on Facebook (e.g., “I make jokes about the problem on Facebook”) and thus was defined as using humour as a coping strategy. An additional item that did not refer explicitly to the use of humour (“I use Facebook to feel like I am close to others”) loaded very highly (.93) on this factor. Previous research has demonstrated that using humour is a way of engendering feelings of closeness with others (e.g., Martin, Puhlik-Doris, Larsen, Gray, & Weir, 2003; Sanford & Eder, 1984). Therefore, this item appeared to fit conceptually with the others and so it was retained.

The fifth factor, avoidance of Facebook, included six items that were derived from the COPE subscales of restraint (e.g., “I avoid doing anything on Facebook that could make the problem worse”) and suppression of competing activities (e.g., “I put aside Facebook in order to concentrate on the problem”). These items were worded to reflect staying away from Facebook in order to concentrate on the problem. Because this factor fundamentally reflected *avoidance* of Facebook as a coping strategy (rather than a type of coping strategy *using* Facebook), this factor was excluded from the SEM analyses that follow.

The sixth factor, venting, included four items that were derived from the COPE venting of emotions subscale (e.g., “I let my feelings out on Facebook”) as well as one of the items from Gordon and her colleagues’ (2007) Internet Use Scales (“I use Facebook to express myself”). Therefore, this factor included items that reflected using Facebook to express emotions and distress.

In the creation of the Facebook COPE, four items were duplicated and listed with and without specific examples of how a coping strategy might be implemented on Facebook (e.g., “I kid around about the situation on Facebook” and “I kid around about the situation on Facebook - for example, make jokes or sarcastic comments about it in my Status Update, or kid around about it on someone's Wall”). These duplicated items were included to examine if participants responded differently based on whether or not there was a specific example of that type of coping using Facebook. The EFA results indicated that in every case, the items with and without examples loaded on the same factor and the more general item loaded more highly on the particular factor than the item with the example (see Table 3). One of these pairs of items, “I avoid doing anything on Facebook that would make the problem worse (such as posting a Status Update when I'm angry about the problem)” loaded on factor 5 (avoidance of Facebook) and so both items were excluded from subsequent SEM analyses. Factor scores on each subscale were calculated with and without these duplicated items and these scores were compared. Results revealed that the internal consistency, *M*, and *SD* of the subscales were equivalent (with rounding) for both versions of each subscale. Because the duplicated items demonstrated lower factor loadings and because there did not appear to be anything to gain by retaining them, these items were excluded from subsequent analyses.⁴

⁴ The Facebook COPE subscales with and without these duplicate items also were compared in the measurement and structural regression models that follow. In each case, the model demonstrated slightly (but not significantly) better fit when the duplicate items were excluded. These results provided further support for the removal of these items.

In summary, exploratory factor analysis of the Facebook COPE resulted in six factors, five of which were retained for the subsequent structural regression analyses: self-sufficient online coping (26 items), direct support seeking (12 items), distraction/avoidance (9 items), humour (4 items), and venting (4 items). Mean scores on each of the five subscales were calculated by summing the responses of items on each subscale and dividing by the number of items. Subscale means and standard deviations are presented in Table 5. Because all subscale scores were averaged, the possible range of scores on each subscale was 1 to 4. Higher scores represented greater use of that subtype of online coping. Data from each of these five subscales demonstrated very good to excellent reliability ($r = .86$ to $.95$; see Table 5).

Validity analyses. Additional analyses were conducted to examine the convergent and discriminant validity of the new Facebook COPE measure. Specifically, correlational analyses were conducted using scores on the five Facebook COPE subscales (self-sufficient online coping, direct support seeking, distraction/avoidance, use of humour, and venting) with scores on the three subscales from the Perceived Social Support Scale (friends, family, and Facebook Friends). If participants were following the instructions for the Facebook COPE and only rating their typical use of Facebook for online coping, it would not be expected that the five Facebook COPE subscales would correlate with offline perceived social support from family or friends, as these would involve different contexts and processes. To provide support for the convergent validity of the Facebook COPE, it would be expected that the five Facebook COPE subscales would correlate with perceived online social support from Facebook Friends. Because Facebook is inherently a social media site, all online coping choices involve either direct (e.g., Private Messages) or indirect/perceived contact (e.g., posting Status Updates; viewing photos) with others.

Table 5

Possible and Observed Ranges, Means, Standard Deviations, and Reliabilities for the Indicator Variables and Validity Measures

Subscale	Range		<i>M</i>	<i>SD</i>	α
	Potential	Actual			
Attachment indicators					
Attachment anxiety	1.00 – 5.00	1.00 – 5.00	2.28	0.82	.82
Attachment avoidance	1.00 – 5.00	1.00 – 4.25	2.55	0.66	.80
Offline coping Indicators					
COPE CFA Model 1b					
Self-sufficient	1.00 – 4.00	1.38 – 3.81	2.58	0.45	.79
Avoidant	1.00 – 4.00	1.08 – 3.42	1.86	0.42	.64
Socially-supported	1.00 – 4.00	1.17 – 4.00	2.77	0.65	.80
COPE CFA Model 1c					
Self-sufficient problem-focused	1.00 – 4.00	1.00 – 3.92	2.56	0.55	.78
Avoidant	1.00 – 4.00	1.08 – 3.42	1.86	0.42	.64
Socially-supported	1.00 – 4.00	1.17 – 4.00	2.77	0.65	.80
Self-sufficient emotion-focused	1.00 – 4.00	1.50 – 3.83	2.60	0.48	.62

Online coping indicators					
Self-sufficient online	1.00 – 4.00	1.00 – 3.35	1.32	0.42	.95
Direct support seeking	1.00 – 4.00	1.00 – 4.00	1.72	0.67	.95
Distraction/avoidance	1.00 – 4.00	1.00 – 4.00	1.89	0.69	.90
Humour	1.00 – 4.00	1.00 – 3.50	1.62	0.63	.86
Venting	1.00 – 4.00	1.00 – 4.00	1.59	0.63	.86
Well-being indicators					
Rosenberg Self-Esteem	1.00 – 4.00	1.00 – 4.00	3.08	0.53	.90
Satisfaction with Life	1.00 – 7.00	1.00 – 7.00	4.94	1.22	.90
Purpose in Life	1.00 – 6.00	1.86 – 6.00	4.55	0.83	.88
PANAS Positive Affect	1.00 – 5.00	1.00 – 5.00	3.25	0.77	.89
Distress indicators					
PANAS Negative Affect	1.00 – 5.00	1.00 – 4.40	2.08	0.72	.85
DASS Total	0.00 – 3.00	0.00 – 2.85	0.73	0.55	.92
UCLA Loneliness	1.00 – 4.00	1.00 – 3.40	2.06	0.53	.94
Composite measures					
Well-being	--	-3.94 – 2.32 ^a	0.00 ^a	1.09 ^a	.84
Distress	--	-1.82 – 2.58 ^a	0.00 ^a	0.87 ^a	.84
Facebook usage and attitudes					
indicator					
Facebook Intensity	--	-1.90 – 1.75 ^a	-0.01 ^a	0.65 ^a	.81

Validity measures

PSS Family	1.00 – 5.00	1.20 – 5.00	3.66	0.78	.95
PSS Friends	1.00 – 5.00	1.10 – 5.00	3.89	0.66	.94
PSS Facebook Friends	1.00 – 5.00	1.50 – 4.95	3.09	0.65	.92

Note. $N = 282$. The mean for all subscales was used because of differing numbers of items and response options per scale.

^a These values are based on standardized z scores.

Therefore, it is likely that all uses of Facebook to cope would be related to *perceived* social support. Means, standard deviations, and internal consistency coefficients for each of these subscales are presented in Table 5.

First, scores on the five Facebook COPE subscales were correlated with scores on the friends and family subscales of the Perceived Social Support Scale. Nonsignificant correlations between these measures would provide support for the discriminant validity of the Facebook COPE scale. In fact, all correlations were nonsignificant (all $ps > .05$), with two exceptions. Greater endorsement of the online coping subscale of venting was significantly associated with less perceived social support from family ($r = -.14; p = .02$) and greater endorsement of the self-sufficient online coping subscale was significantly associated with less perceived social support from friends ($r = -.16; p = .007$). Although significant, the direction of these correlations suggested that individuals who perceived less social support offline were more likely to engage in strategies to obtain social support online. This finding suggests that the Facebook COPE was measuring a different coping process/context than occurred offline. In addition, these correlations were small and the remaining eight correlations were nonsignificant (see Table 6). Overall, these results provide support for the discriminant validity of the Facebook COPE.

Next, scores on the five Facebook COPE subscales were correlated with scores on the Facebook Friends subscale of the Perceived Social Support Scale. Significant positive correlations between these measures would provide support for the convergent validity of the Facebook COPE scale. In fact, scores on all five Facebook COPE subscales were significantly positively related to scores on the perceived social support from Facebook Friends subscale (see Table 6). These correlations ranged from small ($r = .24, p < .001$) to moderate ($r = .55, p < .001$). These results provide support for the convergent validity of

Table 6

Correlations among Facebook COPE Factor Scores and Scores on the Perceived Social Support Subscales

Subscale	1	2	3	4	5	6	7	8
1. Self-sufficient online	---	.63***	.54***	.62***	.66***	-.08	-.16**	.24***
2. Direct support seeking		---	.55***	.56***	.62***	.02	.09	.55***
3. Distraction/avoidance			---	.47***	.52***	-.06	-.06	.24***
4. Use of humour				---	.54***	-.07	-.00	.28***
5. Venting					---	-.14*	-.06	.35***
6. PSS-Family						---	.21***	.16**
7. PSS-Friends							---	.30***
8. PSS-Facebook Friends								---

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

the Facebook COPE and suggest that greater frequency of use of online coping strategies was associated with greater perceived social support from Facebook Friends through online interactions.

In summary, exploratory factor analysis of the Facebook COPE produced five subscales, and further analyses suggested they were reliable and valid in the current sample. These five subscales were used as the indicators of the online coping latent variable. Next, the indicators of each of the latent variables were examined to ensure that the assumptions of structural equation modeling were satisfied.

Latent Variables and Indicators

Indicators for each latent variable are described below. Descriptive statistics and internal consistency coefficients for each indicator are presented in Table 5. Most indicators demonstrated very good to excellent internal consistency. Skewness and kurtosis were examined for each indicator; results revealed that these values were not problematic unless otherwise noted. Missing data were analyzed using the SPSS Missing Value Analysis (MVA), which indicated that no variable was missing more than 5% of data and that data were missing completely at random. Together, these results suggested that imputation of missing values was appropriate (Tabachnick & Fidell, 2001) and this was accomplished using Expectation Maximization (EM) in SPSS MVA. Data on each scale were examined for outliers. One case was found to be a multivariate outlier on the COPE (using Mahalanobis distance, $p < .001$) and examination of this participant's responses revealed that this participant chose the highest response option for nearly all COPE items. Because a response bias was suspected, this case was excluded from further analyses. The remaining sample size of 282 participants was above the minimum sample size of 200 generally recommended for SEM analyses (e.g., Weston & Gore, 2006).

Preliminary analyses of gender differences. Independent samples *t*-tests were used to conduct gender comparisons for the independent variables of attachment anxiety, attachment avoidance, and Facebook usage and attitudes. There were no significant differences in the scores for male ($M = 2.29$, $SD = .84$) and female ($M = 2.27$, $SD = .83$) participants in attachment anxiety ($t(277) = .15$, $p = .88$) or for male ($M = 2.60$, $SD = .66$) and female ($M = 2.54$, $SD = .66$) participants in attachment avoidance ($t(277) = .58$, $p = .56$). There was a significant difference in the standardized scores for males ($M = -.25$, $SD = .69$) and females ($M = .03$, $SD = .64$) on the Facebook Intensity Scale ($t(254) = -2.60$, $p = .01$), indicating that females reported significantly higher scores on a composite measure of their Facebook use, number of Friends, and positive attitudes toward Facebook.

Complex structural regression models, such as that presented in this paper, typically do not include control variables, because the nature of structural equation modeling accounts for additional sources of variance not included in the study (Kline, 2011). Given this rationale, as well as the finding that scores on the latent variables of attachment anxiety and attachment avoidance did not differ significantly between males and females, gender was not controlled for in the SEM models that follow. Because a significant gender difference was observed in Facebook usage and attitudes, subsequent partial and bivariate correlational analyses using this variable were conducted with and without controlling for gender. The results revealed that the *r*-values were identical or nearly identical and the *p*-values were equivalent, regardless of whether or not gender was treated as a control variable. Given these findings, as well as the gender imbalance in the present sample, gender was not controlled for in further analyses.

Attachment. There were two attachment latent variables, attachment anxiety and attachment avoidance. Each latent variable contained one indicator of the same name. The attachment anxiety indicator was derived from the mean score of the five items on the RSQ (Griffin & Bartholomew, 1994b) that were derived from Simpson and his colleagues' (1992) measure of attachment anxiety. The attachment avoidance indicator was derived from the mean score of the eight items on the RSQ (Griffin & Bartholomew, 1994b) that were derived from Simpson and his colleagues' (1992) measure of attachment avoidance.

Treating each of these subscales as indicators of a latent variable, rather than as observed variables, has the advantage of incorporating measurement error into the tested models. However, SEM requires an additional procedure for latent variables that have fewer than three indicators in order for the model to be identified. Kline (2011) recommends that for latent variables with only one indicator, the error variance of each indicator variable should be fixed based on an a priori estimate of the proportion of variance due to measurement error, or $(1 - r_{xx})(s^2_{x1})$. The error variance for each attachment indicator was calculated using Kline's formula, which resulted in an error variance of 0.13 for attachment anxiety and 0.09 for attachment avoidance. Finally, the unstandardized loading of each indicator on each attachment latent variable was fixed to 1.0 to scale each latent variable.

Offline coping. The latent variable of offline coping contained two different sets of indicator variables, given equivocal findings for the three- and four-factor confirmatory factor analyses of the COPE (Carver et al., 1989). The two sets of indicator variables were compared in alternative measurement models to determine which model provided the best fit for the structural regression models that followed. The three-factor solution

contained the indicators of self-sufficient coping, socially-supported coping, and avoidant coping. The four-factor solution contained the indicators of self-sufficient problem-focused coping, self-sufficient emotion-focused coping, socially-supported coping, and avoidant coping. The distributions for the avoidant coping factor in both models demonstrated significant positive skewness. The distribution of the data was improved following a square-root transformation of the data and these transformed scores were used in further analyses.

Online coping. The latent variable of online coping contained five indicators. Scores on each of the five Facebook COPE subscales (self-sufficient online coping, direct support seeking, distraction/avoidance, humour, and venting) were used as indicator variables for the latent variable of online coping. Examination of the distributions of these subscales revealed significant positive skewness and problematic kurtosis for each indicator. Square root transformations of the data did not significantly improve the normality of the distributions. Logarithmic transformations resulted in approximately normal distributions for data from the direct support seeking, distraction/avoidance, and humour subscales. The distributions of data from the self-sufficient online coping and venting subscales also were improved following logarithmic transformations, although the data continued to demonstrate significant positive skewness. Given these improvements, the transformed scores on all subscales were used in subsequent analyses.

Well-being. The latent variable of well-being contained four indicators. These indicators included the mean score on the 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965), the mean score on the 5-item Satisfaction with Life Scale (SWLS; Diener et al., 1985), the mean score on the 14-item Purpose in Life subscale of Ryff's

(1989) Well-Being Scales, and the mean score on the 10-item Positive Affect (PA) subscale of the PANAS (Watson et al., 1988).

Distress. The latent variable of distress included three indicators. These indicators included the mean score on the 10-item Negative Affect (NA) subscale of the PANAS (Watson et al., 1988), the mean score on the 20-item UCLA Loneliness Scale (Version 3; Russell, 1996), and the total mean score of the depression, anxiety, and stress subscales from the 21-item Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1995). The total scale score was used rather than the three subscale scores to prevent problems with multicollinearity, given the large intercorrelations among subscales ($r_s = .64$ to $.74$, $p_s < .001$) and the large correlations between each subscale and the total scale ($r_s = .87$ to $.90$, $p_s < .001$). Examination of the distribution of this scale revealed problematic positive skewness; a square-root transformation significantly improved the distribution and the transformed data were used in further analyses. For ease of interpretation, nontransformed data are presented in Table 5.

Two-Step Structural Equation Modeling Analyses

As recommended by Kline (2011), the structural regression (SR) model was tested using two-step structural equation modeling. First, the measurement portion of the model was examined. To do so, the relations among all of the latent variables and their indicators were tested as a confirmatory factor analysis measurement model by specifying correlations among all latent variables. This step provides a test of the fit of the measurement portion of the SR model (i.e., whether all indicators load on the latent variables as predicted). Second, the fit of this CFA model was compared to the fit of structural models specifying particular directional relations among the latent variables. Hypotheses one through four were tested in this second step.

Bootstrapping analyses were conducted on the measurement and structural regression models that follow to address concerns about the normality of the distributions of the Facebook COPE subscales. Deviations from normality in the indicators of an SEM model can result in inflated values of χ^2 , underestimates of some fit indices, and artificially low standard errors, which can result in statistically significant regression paths and covariances for the non-normal sample that may not be significant in the population (Byrne, 2010). One thousand bootstrapped samples were generated by sampling with replacement from the original data set. This method produces bootstrapped estimates of the standard errors that do not assume normality of distributions and thus are more accurate when data are not normally distributed (Kline, 2011). No significant differences emerged between the original and the bootstrapped standard errors. In addition, all significant paths obtained from the original data set remained significant using the bootstrapped standard errors and all non-significant paths remained non-significant. These findings suggest that the following results were not greatly influenced by the non-normality of the Facebook COPE data and thus these findings can be interpreted with confidence.

Measurement model. Two CFA models were compared. Both of these models included the latent variables of offline coping, online coping, attachment anxiety, attachment avoidance, well-being, and distress along with their respective indicators. The primary difference between the two models was the indicators for the offline coping (COPE) data. The first model (Model 2a) utilized the three-factor COPE solution. The second model (Model 2b) utilized the four-factor COPE solution.

Analysis decisions. The CFA models were tested using AMOS version 18.0. The covariance matrix was analyzed and the Maximum Likelihood estimation method was

used. In both models, one factor loading for each indicator was fixed to 1 to scale the latent variables. For Model 2a, the loadings for the following indicators were set to 1: self-sufficient online coping (online coping), self-sufficient offline coping (offline coping), attachment avoidance, attachment anxiety, positive affect (well-being), and negative affect (distress). The same paths were used to scale the latent variables in Model 2b, with the exception of offline coping. In Model 2b, factor 1 (self-sufficient problem-focused coping) was set to 1 to scale the offline coping latent variable.

Model evaluation. First, the solutions were evaluated for irregularities (e.g., Heywood cases; convergence problems). Analyses for Model 2a, using the three-factor COPE solution, indicated that the covariance matrix was not positive definite and thus the solution was inadmissible. Further examination of both Model 2a and 2b suggested that the source of this error was related to problems with the offline coping indicator of avoidant coping (COPE factor 2). This variable demonstrated low squared multiple correlations and loaded negatively on the offline coping latent variable in both models. It appeared that this variable, which reflected avoidance of coping, did not fit well with the other, more directive coping strategies (i.e., self-sufficient problem- and emotion-focused coping and support seeking), which loaded positively on the offline coping latent variable. These inverse relations between indicators of the same latent variable most likely caused the problems with this solution. The solution for the four-factor COPE model was admissible and thus Model 2b was retained for further analyses.

The following modifications were made to Model 2b. First, the offline coping indicator variable of avoidant coping (factor 2 from the COPE solution) did not appear to fit well with the measurement model (e.g., low squared multiple correlations and negative

loadings), and so it was excluded⁵. Previous researchers also have excluded this factor as an indicator of offline coping due to poor model fit (e.g., Landen & Wang, 2010)⁶.

Second, error covariances were added between the indicators of positive affect and negative affect, between negative affect and the DASS total score, between offline social support and loneliness, between offline social support and attachment avoidance, and between online self-sufficient coping and purpose in life. These covariances reflected theoretically meaningful relations that were not adequately captured by the covariances among latent variables and adding them to the model resulted in substantial improvement in model fit.

The final measurement Model 2b is depicted in Figure 3. The exact-fit hypothesis for this model was rejected ($\chi^2 (101) = 227.92, p < .001$). However, the values for various fit statistics revealed adequate to good fit (CFI = .95; IFI = .95; RMSEA = .07, 90% C.I. = .06 to .08; see Table 7). Standardized factor loadings were uniformly high for the indicators of the online coping, well-being, and distress latent variables, which suggested convergent validity for these indicators (Kline, 2011). The factor loadings for the

⁵ These models also were evaluated using scores on the avoidant coping factor calculated using the cross-loadings present in Models 1b and 1c. The same problems arose with this indicator regardless of how the avoidant subscale was calculated.

⁶ Landen and Wang (2010) also conducted confirmatory factor analysis of data from the COPE and found problems with their maladaptive (avoidant) coping factor. They excluded this factor from their final model as they found that it did not load significantly on their latent coping variable and their model fit was significantly improved with this factor excluded.

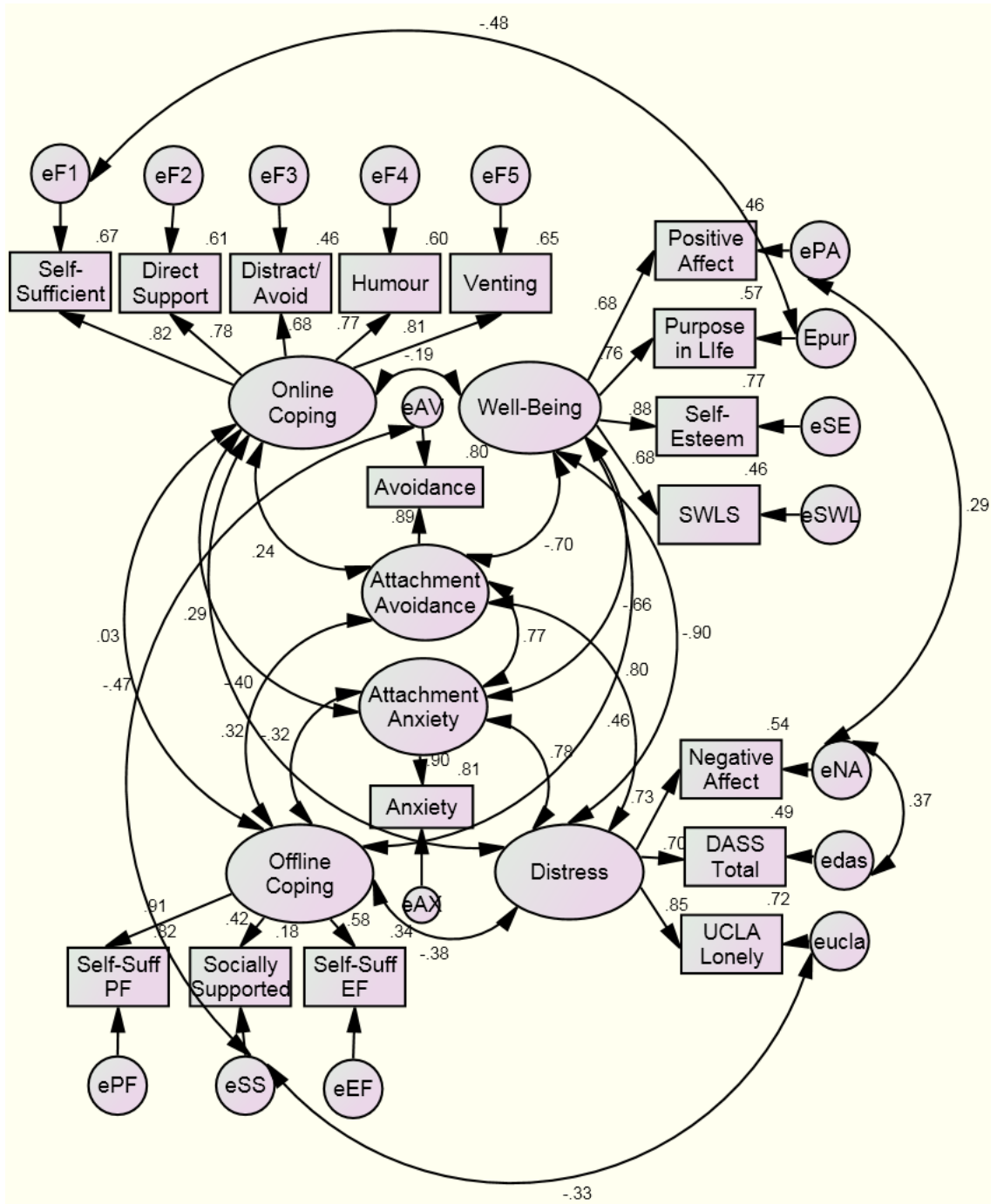


Figure 3. Final measurement model (Model 2b) with standardized maximum likelihood parameter estimates. This model includes correlations among all latent variables. All paths and correlations are significant at $p < .05$, with the exception of the correlation between online coping and offline coping ($p > .05$).

Table 7

Selected Fit Indices for Final Measurement Model and Structural Regression Models

Model	χ^2	(df)	RMSEA	90% C.I.	CFI	IFI	AIC
Measurement Model							
Model 2b	227.92*	101	.07	(.05 - .08)	.95	.95	--
Structural Regression Models							
Model 3a	227.92*	101	.07	(.05 - .08)	.95	.95	365.92
Model 3b	280.39*	106	.08	(.07 - .09)	.93	.93	409.98
Model 3c	232.24*	102	.07	(.06 - .08)	.95	.95	368.24
Model 3d	233.99*	106	.07	(.05 - .08)	.95	.95	361.99
Equivalent Model							
Model 4	223.20*	106	.06	(.05 - .07)	.95	.95	--
Alternative Models							
Model 5a	293.79*	122	.07	(.06 - .08)	.93	.93	--
Model 5b	285.60*	122	.07	(.06 - .08)	.94	.94	--

Note. RMSEA = Root-Mean-Square Error of Approximation; CFI = Comparative Fit Index; IFI = Incremental Fit Index; AIC = Akaike's Information Criterion.

* $p < .001$

offline coping latent variable were moderate to high (ranging from .42 to .91), suggesting mixed evidence for convergent validity. All latent variable and error covariances were significant, with the exception of the covariance between offline and online coping, which suggests that significant relations existed among the latent variables and thus further path analyses using this measurement model were justified. The finding of a nonsignificant relation between offline and online coping was inconsistent with hypothesis 4, which predicted that individuals would choose similar types of coping strategies offline and online.

Structural regression models. The second step of the structural regression analysis involved testing the expected associations among latent variables in order to test hypotheses one through four. This hypothesis testing was conducted in two parts. First, the models were tested and compared in order to obtain the most appropriate structural regression model; second, the hypotheses were evaluated using this final model. Four models were compared. First, a baseline model was created by specifying the measurement model as a just-identified structural model (Kline, 2011); that is, directional paths were specified between every pair of latent variables. The chi-square difference test was used to test the statistical significance of the change in model fit as free parameters were eliminated from the model. A significant result suggests that the more parsimonious model demonstrates significantly worse fit than the original model (Kline, 2011). Because the models that followed were nested or hierarchical (i.e., the measurement model was identical for each competing model; only the structural components or paths changed) an additional fit index was examined. Akaike's (1987) Information Criterion (AIC) was used in the comparison of the hierarchical models because it incorporates parsimony into the assessment of model fit by providing lower values for models that demonstrate both

goodness of fit and fewer estimated parameters. Thus, the AIC values produced by each model are compared and the model with the lowest AIC value is preferred (e.g., Byrne, 2010). Fit statistics for each of the four models (Models 3a through 3d) are presented in Table 7. No irregularities were noted in these solutions.

Model testing. The first model analyzed (Model 3a) was equivalent to the measurement model 2b depicted in Figure 3, except that all covariances between latent variables were re-specified as directional paths. Because it was equivalent to Model 2b, fit statistics were identical to the measurement model (see Table 7) and factor loadings and error variances and covariances were identical within rounding. This model served as the baseline against which Models 3b through 3d were compared.

Model 3b tested a fully-mediated model; that is, the associations between attachment anxiety and attachment avoidance with well-being and distress were specified to be fully mediated by offline and online coping, as predicted by hypotheses 3a and 3b (see Figure 4). Attachment anxiety and avoidance were allowed to correlate in Model 3b and in all subsequent structural regression models. A covariance was added between the disturbance terms for well-being and distress given the high correlation observed between these variables ($r = -.79, p < .001$). The chi-square difference test was significant ($\chi^2_D(5) = 52.47, p < .001$), suggesting that this model demonstrated significantly worse fit than the baseline model. Similarly, the AIC value obtained was higher than that for the baseline model (see Table 7). This decrement in model fit suggested that the model was oversimplified and thus hypotheses 3a and 3b were not fully supported as the relations between attachment avoidance and anxiety with adjustment (well-being and distress) were not fully mediated by online and offline coping.

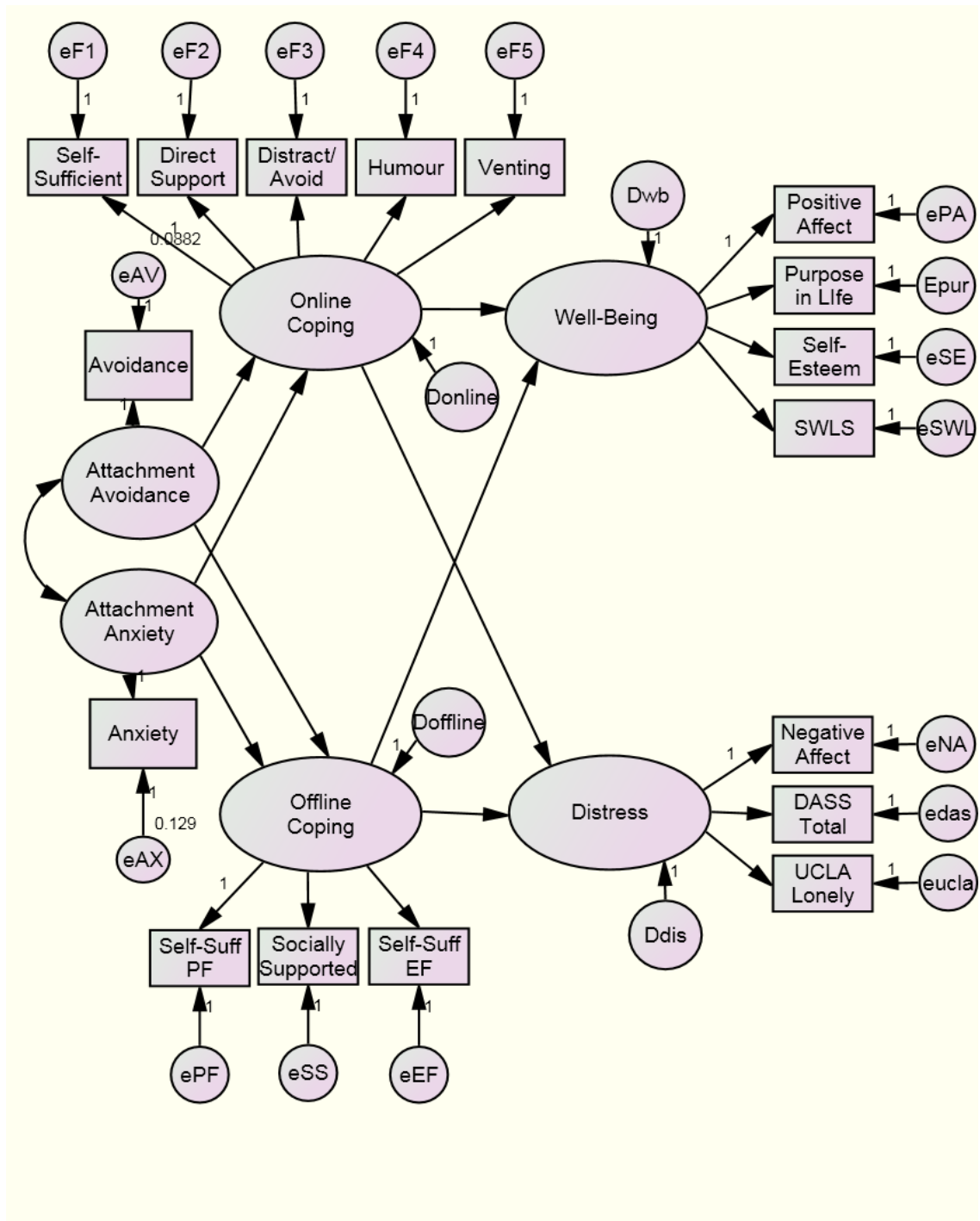


Figure 4. Structural regression Model 3b. This model tested the hypothesis that the associations between attachment avoidance and attachment anxiety with well-being and distress were fully mediated by offline and online coping. Parameter estimates and error covariances are not depicted for clarity of presentation, as this model was not retained.

Model 3c tested a model that included both direct and mediated relations (see Figure 5). In addition to the mediational pathways included in Model 3b (assessing whether the relations between attachment anxiety and avoidance with well-being and distress were mediated by online and offline coping), direct paths were added between attachment anxiety and attachment avoidance with each of the adjustment latent variables of well-being and distress. This model demonstrated adequate to good fit, and the AIC value obtained was slightly higher than that of the baseline model (see Table 7), which suggested that the model may have been slightly oversimplified. However, the chi-square difference test was not significant ($\chi^2_{\text{D}}(1) = 4.32, p > .01$), indicating that this model did not demonstrate significantly worse fit than the baseline model (see Table 7).

Examination of the parameter estimates and associated significance tests indicated that a number of parameters included in Model 3c were not significant. Specifically, the path between attachment avoidance and online coping, the path between attachment anxiety and offline coping, the path between online coping and well-being, and the path between offline coping and distress were not significant. These paths were eliminated from the model to make the model more parsimonious. This resulted in the final model, Model 3d, which is depicted in Figure 6 with standardized parameter estimates, correlations, and variances. The values for all unstandardized paths in this model were significant at $p < .05$. Factor loadings and error variances were generally equal to those for measurement Model 2b, suggesting a stable solution. Fit statistics are presented in Table 7 and indicate adequate to good fit. The chi-square difference test was not

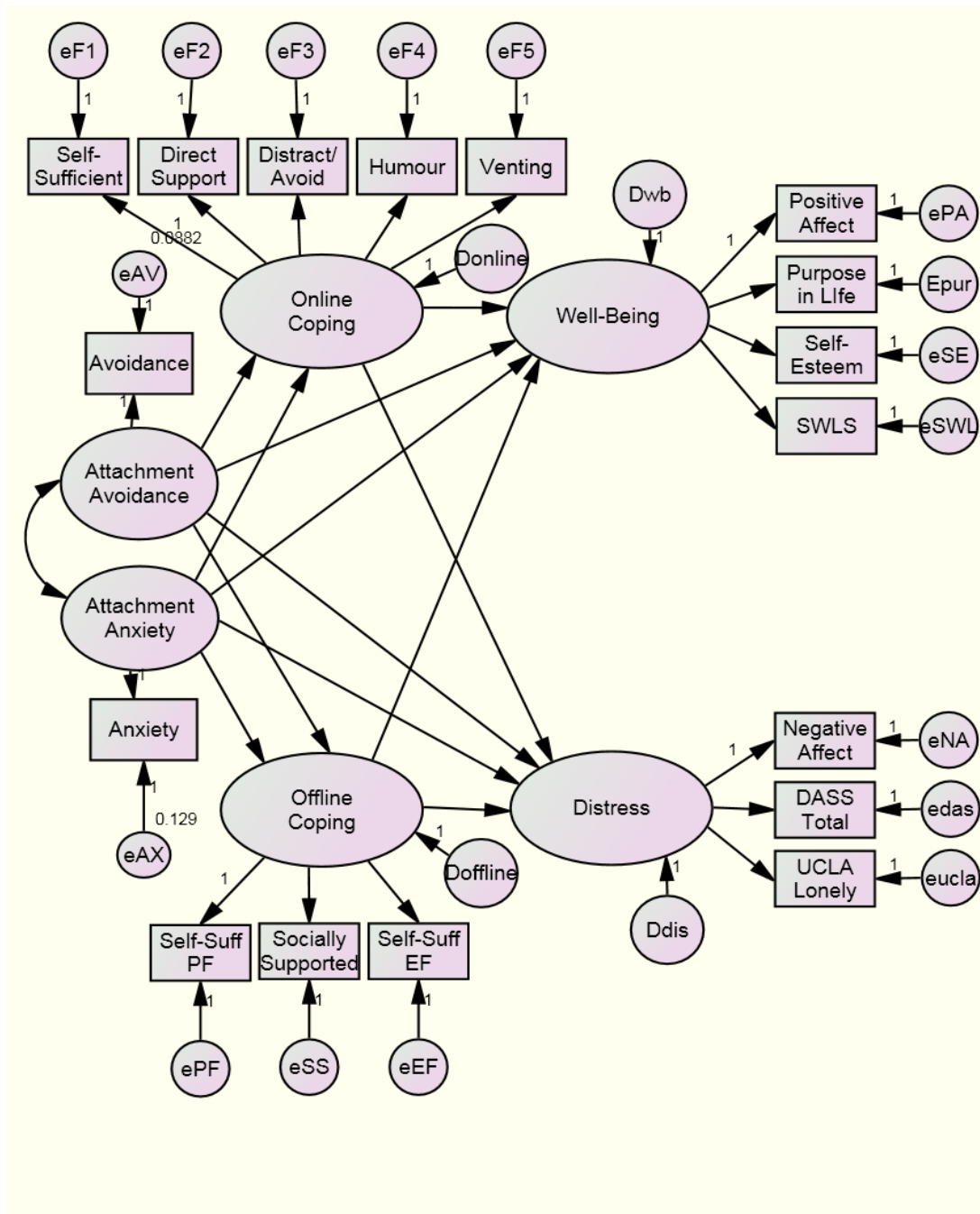


Figure 5. Structural regression Model 3c. This model included both direct pathways between attachment avoidance and attachment anxiety with well-being and distress, as well as mediated pathways between the attachment variables and the adjustment variables through online and offline coping. Parameter estimates and error covariances are not depicted for clarity of presentation, as this model was not retained.

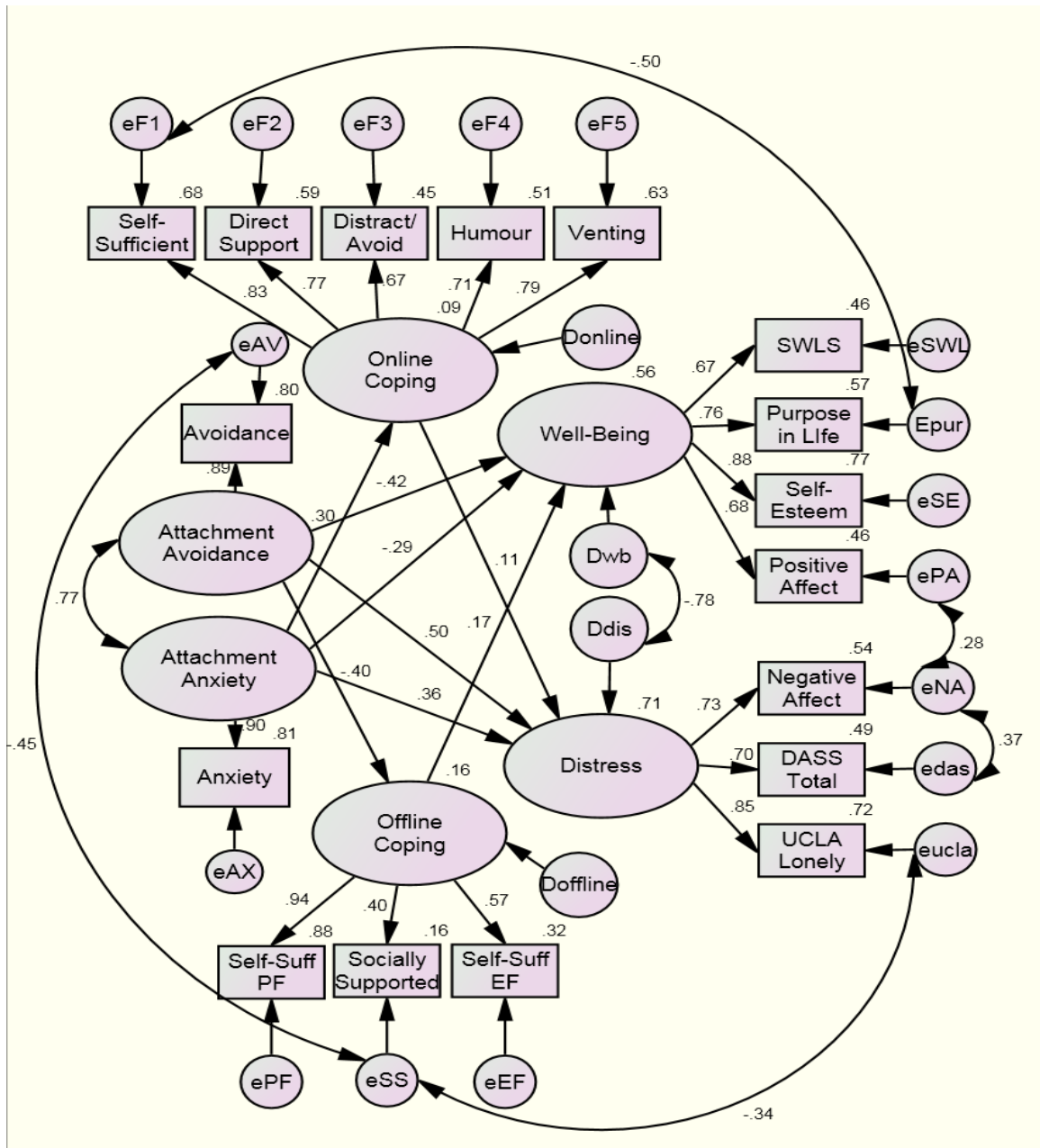


Figure 6. Final structural regression model (Model 3d) with standardized maximum likelihood parameter estimates. This model depicts direct paths between attachment avoidance and attachment anxiety with well-being and distress as well as indirect (mediated) paths from attachment avoidance to well-being through offline coping and from attachment anxiety to distress through online coping. All paths are significant at $p < .05$.

significant ($\chi^2_D(5) = 6.07, p > .05$), suggesting that this more parsimonious model did not demonstrate significantly worse fit than the baseline model. Additional support for Model 3d was obtained by examining the AIC value, which was lower than that of the baseline Model 3a as well as Models 3b and 3c.

Two mediational pathways were significant in this final model (see Figure 6). First, the relation between attachment anxiety and distress was mediated by online coping. These results provided partial support for alternative hypothesis 1a, which predicted that greater attachment anxiety would be associated with increased online coping. Examination of the path coefficients revealed that attachment anxiety was significantly positively associated with online coping. In turn, online coping was significantly positively associated with distress. Although hypothesis 3a stated the relation between attachment anxiety and adjustment would be mediated by coping, this positive association between online coping and distress was contrary to the prediction of hypothesis 3a and suggested that the Facebook COPE factors retained in measurement Model 2b (self-sufficient online coping, direct support seeking, distraction/avoidance, use of humour, and venting) may represent maladaptive coping efforts. Overall, these results indicated that participants who reported greater attachment anxiety also reported engaging in maladaptive online coping strategies more often. Due in part to these maladaptive online coping efforts, individuals with greater attachment anxiety also reported greater distress (e.g., increased experience of negative affect, depression, anxiety, stress, and loneliness).

Second, the relation between attachment avoidance and well-being was mediated by offline coping. These results provided partial support for hypothesis 1b, which predicted that greater attachment avoidance would be associated with decreased adaptive

offline coping. It also provided partial support for hypothesis 2, which predicted that greater use of adaptive offline coping would be associated with improved adjustment outcomes, as well as hypothesis 3b, which predicted that the relation between attachment avoidance and adjustment would be mediated by coping. Examination of the path coefficients revealed that attachment avoidance was significantly negatively associated with offline coping. In turn, offline coping was significantly positively associated with well-being. This positive association between offline coping and well-being suggests that the COPE factors retained in measurement Model 2b (self-sufficient problem-focused coping, self-sufficient emotion-focused coping, and socially-supported coping) all represented adaptive coping efforts. Overall, these results indicated that participants who reported greater attachment avoidance also reported engaging in adaptive offline coping strategies less often. Because greater use of these offline coping strategies was associated with greater well-being (i.e., greater sense of purpose in life, experience of positive affect, satisfaction with life, and self-esteem), individuals higher in attachment avoidance did not report greater well-being when compared to individuals who were lower in attachment avoidance.

Direct relations between the attachment variables and the adjustment variables also were observed (see Figure 6). Examination of the path coefficients revealed that attachment anxiety was significantly negatively related to well-being and significantly positively related to distress. Similarly, attachment avoidance was significantly negatively associated with well-being and significantly positively related to distress. The significance and magnitude of these direct paths suggested that attachment-related anxiety and avoidance had direct relations with well-being and distress, above and beyond the mediational pathways. Specifically, greater self-reported attachment anxiety and

attachment avoidance both were associated with greater distress and reduced well-being. These results were inconsistent with the predictions of hypotheses 3a and 3b, which stated that the associations between attachment and adjustment would be fully mediated by offline and online coping choices.

Given the cross-sectional nature of the data obtained in this study, it could not be stated that online coping caused increases in distress or did not cause any change in well-being. An alternate possibility, that individuals' well-being or distress influenced their tendency to engage in online coping using Facebook, was examined through the investigation of an equivalent structural regression model.

Equivalent models. It is recommended that SEM researchers examine equivalent models (i.e., alternative models that also could explain the observed covariances in a data set), particularly when data are collected at only one time (e.g., Kline, 2011). Equivalent models can be created by simply reversing the direction of the arrows in a path or structural regression model. Given that a complex structural regression model such as Model 3d could have an unmanageable number of equivalent models, theoretical and practical considerations were used to determine the choice of equivalent models to be evaluated in this study. Using these guidelines, one theoretically-plausible alternative model of interest, Model 4, was developed and tested. There is a great deal of theory and research to support the assumption that attachment anxiety and attachment avoidance develop first, beginning in childhood (e.g., Ainsworth et al., 1978); therefore, these variables were retained as exogenous predictor variables. There also is research support for the directional path between offline coping and adjustment (e.g., Ben-Zur, 2009; Suldo, Shaunessy, & Hardesty, 2008; Wilkinson, Walford, & Espnes, 2000) and thus these path were retained. In contrast, online coping is a new area of interest, and research

in this area is limited. It could be the case that individuals' levels of well-being and distress influenced their tendency to engage in online coping using Facebook. Model 4 tested this alternative proposition and is depicted in Figure 7. Fit statistics for alternative Model 4 are presented in Table 7. These statistics suggested good fit and some were slightly more favourable than those obtained for Model 3d. The improvement in model fit over Model 3d could not be tested statistically as Model 3d and Model 4 were not nested; however, this difference did not appear to be significant given that many of the obtained fit statistics were identical across the two models. The values for all unstandardized paths in this model were significant at $p < .01$. Two pathways were of particular interest in this model – the directional paths between well-being and online coping and between distress and online coping. Examination of the path coefficients (see Figure 7) revealed that both well-being and distress demonstrated significant and sizable positive relations with online coping. These results suggested that (a) participants who reported greater well-being also reported greater frequency of online coping and (b) participants who reported greater distress also reported substantially greater frequency of online coping.

The standardized path coefficient for the path from online coping to distress obtained in Model 3d was much lower than the coefficient obtained for the reversed path from distress to online coping in Model 4. The path from online coping to well-being was not significant and thus was excluded from Model 3d, whereas the reversed path from well-being to online coping was significant in Model 4. Therefore, the path coefficients observed in alternative Model 4 are substantially larger than those obtained in Model 3d. These results, in combination with the high fit indices obtained and the theoretical validity of this revised model, suggest that Model 4 is a viable alternative model to Model

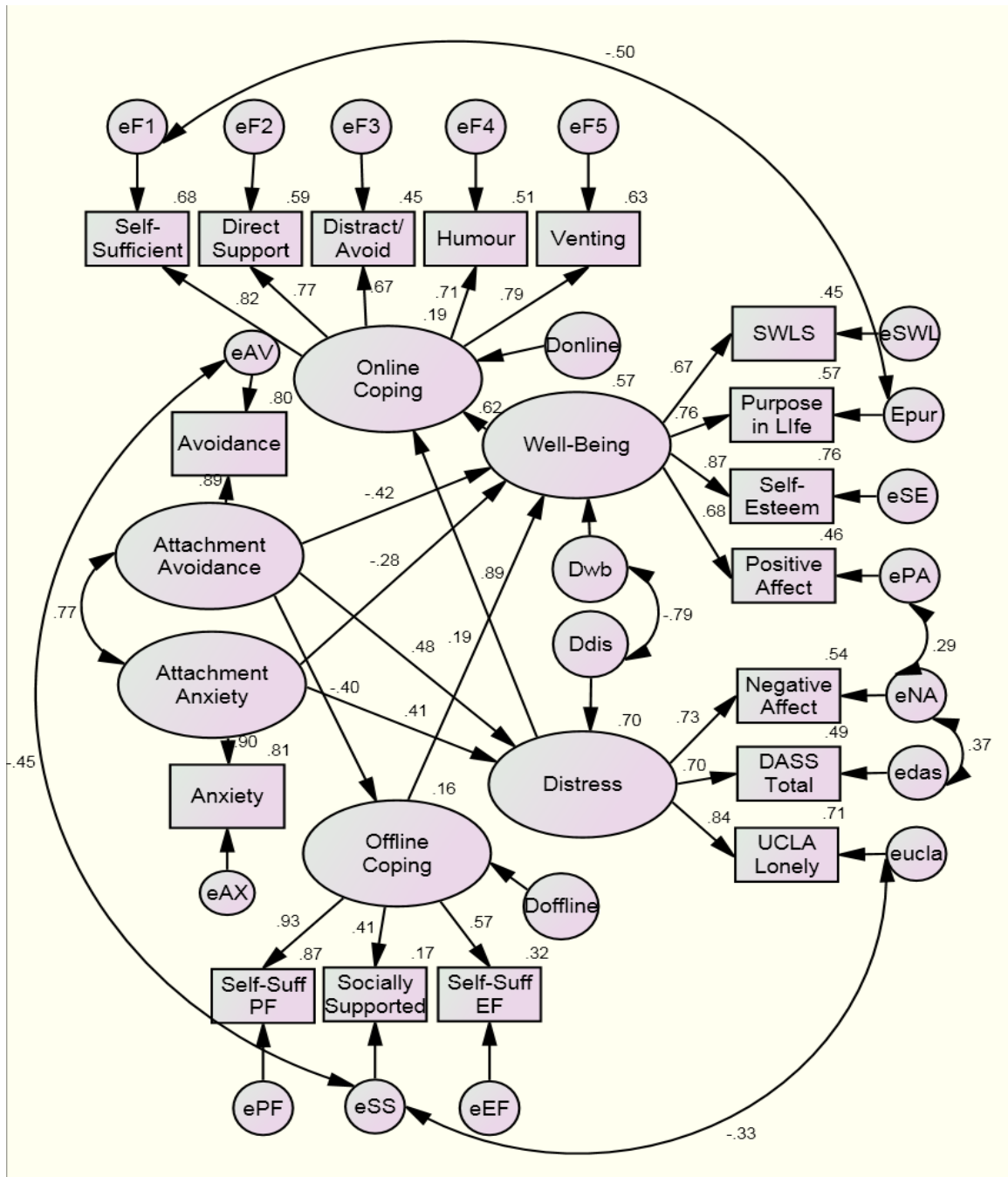


Figure 7. Alternative structural regression Model 4 with standardized maximum likelihood parameter estimates. This model tested the alternative proposition that well-being and distress had a direct influence on online coping using Facebook. The directions of the remainder of the paths are identical to those in Model 3d. All paths are significant at $p < .01$.

3d. Given that this is the first study of this kind, and the first using the Facebook COPE, the decision regarding which model is “correct” is deferred at this time.

Summary of structural regression model analyses. In summary, the results of the SEM analyses revealed both direct and indirect effects of attachment on adjustment. Greater attachment anxiety was directly associated with reduced well-being and increased distress, as well as being indirectly associated with increased distress due to greater use of seemingly maladaptive online coping strategies. Greater attachment avoidance was directly associated with reduced well-being and increased distress, as well as being indirectly associated with reduced well-being due to decreased use of adaptive offline coping strategies. The equivalent model tested the reversed associations for adjustment and Facebook coping and found that both greater well-being and greater distress were related to greater use of online coping.

The finding that online coping was positively related to distress was surprising, as it was expected that some types of online coping (e.g., self-sufficient problem- and emotion-focused coping and seeking social support) would be beneficial for adjustment. Additional analyses were conducted to further explore the correlates of online Facebook coping given these surprising and somewhat contradictory findings.

Additional Facebook COPE Analyses

Additional analyses were conducted to test hypothesis 5, as well as to explore the relations between each of the five types of online coping strategies with the variables of Facebook usage and attitudes, attachment, and adjustment. First, scores on the Facebook Intensity Scale were incorporated into Model 3d and Model 4 to determine whether Facebook usage and attitudes served as a significant predictor of the online coping latent variable. Second, correlational analyses were conducted to examine whether or not

Facebook usage and attitudes were uniformly related to each of the five Facebook COPE subscales. Third, scores on each of the five Facebook COPE subscales were correlated with scores on attachment anxiety and attachment avoidance to explore the relations between each subscale and attachment. Finally, scores on each of the online coping subscales were correlated with composite scores for well-being and distress to clarify the relations between each type of online coping and adjustment.

Facebook usage and attitudes. The Facebook Intensity Scale (Ellison et al., 2007) was used to test hypothesis 5, which stated that individuals who reported greater Facebook usage and more positive Facebook attitudes would more frequently engage in online coping using Facebook, when compared to those individuals who reported less frequent and enthusiastic Facebook use. Therefore, a Facebook usage and attitudes latent variable was added to both Model 3d and Model 4 as another predictor of online coping.

The latent variable of Facebook usage and attitudes contained one indicator, which was derived from the standardized averages of the Facebook Intensity Scale (Ellison et al., 2007). A second indicator variable was created by calculating the mean score of six items that assessed participants' frequency of use of various Facebook functions (i.e., number of photo albums, Groups belonging to, Groups created, Events attended, Events created, and Notes). However, data on this scale demonstrated poor reliability ($\alpha = .38$) and preliminary analyses indicated that this indicator fit poorly in the model. This indicator was excluded for these reasons. Because the Facebook usage and attitudes latent variable had only one indicator, the error variance of this single indicator variable was fixed at 0.08 using Kline's (2011) formula: $(1 - r_{xx})(s^2_{x1})$. The unstandardized loading of the Facebook Intensity Scale indicator on the Facebook attitudes and usage latent variable was fixed to 1.0 to scale the latent variable.

The Facebook usage and attitudes latent variable was added to the structural regression models to test the hypothesis that participants who reported greater Facebook usage and more positive Facebook attitudes would more frequently engage in online coping using Facebook. This variable was included in Model 3d as an exogenous predictor variable of the online coping latent variable, resulting in Model 5a. Fit statistics for this model are presented in Table 7. These values suggested worse fit than that obtained for Model 3d (e.g., $\chi^2_{5a}(122) = 293.79, p < .001$); however, significance tests of the decrement in fit could not be computed as Model 5a and Model 3d were not nested.

The Facebook usage and attitudes variable also was added to alternative Model 4 as an exogenous predictor of the online coping latent variable, resulting in Model 5b. The fit of this model ($\chi^2_{5b}(122) = 285.60, p < .001$) was slightly better than that of Model 5a, but worse than that of Model 4 (see Table 7). Models 5a and 5b are not depicted as the measurement and structural portions are otherwise identical to Models 3d and 4 respectively and only the path from Facebook usage and attitudes to online coping was of interest.

Despite the poorer overall fit, examination of the pathway between Facebook usage and attitudes and online coping revealed a sizable relation in both Model 5a and Model 5b. The unstandardized path coefficient for this path ($B = .05$ in both Model 5a and Model 5b) was statistically significant ($p < .01$). The corresponding standardized path coefficient ($\beta = .50$ in Model 5a; $\beta = .51$ in Model 5b) indicated that a one *SD* increase in Facebook usage and attitudes scores was associated with a .50 or .51 *SD* increase in online coping. These results supported hypothesis 5 and suggested that greater Facebook usage and more positive Facebook attitudes were associated with more frequently engaging on online coping strategies via Facebook. However, it was not apparent from

these analyses whether Facebook usage and attitudes had differential associations with each of the five types of coping strategies on Facebook and thus additional analyses were conducted to explore these relations.

Correlational analyses. Additional correlational analyses were conducted to explore the relations between each of the online coping strategies with Facebook usage and attitudes, attachment, and adjustment. In addition, the avoidant offline coping factor that was previously excluded from the structural regression models was included in these correlational analyses to explore how avoidant offline coping related to online coping choices, Facebook usage and attitudes, attachment, and adjustment. Finally, the relations among well-being and perceived social support were examined to further explore the unexpected finding of a significant positive pathway from well-being to online coping in alternative Model 4.

Facebook usage and attitudes. To further explore hypothesis 5, scores on the five Facebook COPE factors were correlated with scores on the Facebook Intensity Scale. Results revealed that Facebook usage and attitudes were significantly positively correlated with scores on each of the five Facebook COPE factors (see Table 8; all $ps < .001$). These results provided additional support for hypothesis 5 and suggested that more frequent Facebook use, as well as more positive attitudes toward Facebook, were associated with more frequent use of a variety of coping strategies on Facebook, not just one type of coping.

Attachment. Scores on the five Facebook COPE subscales also were correlated with attachment anxiety and attachment avoidance to determine how each online coping subscale individually related to the two attachment dimensions. As shown in Table 8, analyses indicated that four of the five Facebook COPE subscales (self-sufficient online,

Table 8

Correlations among Facebook COPE Factor Scores and Scores on the Facebook Intensity Scale, Well-Being Composite, Distress Composite, Avoidant Offline Coping Factor, Attachment Anxiety, and Attachment Avoidance

Subscale	6	7	8	9	10	11
1. Self-sufficient online	.31***	-.17**	.27***	.45***	.26***	.22***
2. Direct support seeking	.44***	-.04	.13*	.25***	.07	-.00
3. Distraction/avoidance	.53***	-.22***	.34***	.41***	.27***	.26***
4. Use of humour	.24***	-.06	.22***	.30***	.17***	.13*
5. Venting	.42***	-.13*	.26***	.27***	.22***	.14*
6. Facebook Intensity Scale	---	.00	.01	.18**	.07	-.05
7. Well-being composite		---	-.70***	-.52***	-.53***	-.58***
8. Distress composite			---	.48***	.62***	.60***
9. Avoidant offline coping				---	.44***	.38***
10. Attachment anxiety					---	.63***
11. Attachment avoidance						---

Note. Intercorrelations among the five Facebook COPE subscales are presented in Table 6.

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

distraction/avoidance, humour, and venting) demonstrated significant positive correlations with both attachment anxiety (r s ranged from .17 to .27, all p s < .001) and attachment avoidance (ranging from $r = .13$, $p = .02$, to $r = .26$, $p < .001$). In contrast, the direct support seeking subscale of the Facebook COPE was not significantly associated with either attachment anxiety ($r = .07$, $p = .24$) or attachment avoidance ($r = -.004$, $p = .95$). These results indicated that individuals who reported greater levels of attachment anxiety and attachment avoidance also reported greater use of each of the online coping strategies assessed, with the exception of directly seeking support through Facebook.

Well-being and distress. Next, scores on the five Facebook COPE factors were correlated with the composite well-being and distress scores to further clarify the implications of online coping for adjustment. Whereas the results of the SEM analyses suggested positive relations between online coping as a composite latent variable and distress, these analyses were conducted in order to determine how each online coping subscale individually related to well-being and distress. Results of these analyses also are presented in Table 8. Each of the five Facebook COPE factor scores was significantly positively related to distress (ranging from $r = .13$, $p = .03$, to $r = .34$, $p < .001$). Three of the five Facebook COPE subscales (self-sufficient online, distraction/avoidance, and venting) were significantly negatively correlated with well-being (ranging from $r = -.13$, $p = .03$, to $r = -.22$, $p < .001$). The remaining two subscales (direct support-seeking and use of humour) demonstrated negative but nonsignificant correlations with well-being. These results suggested that each of the online coping strategies measured with the Facebook COPE was consistently related to increased distress and that coping on Facebook for the purposes of self-sufficient coping, distraction/avoidance, and venting were related to reduced well-being. These results were contrary to the predictions of hypothesis 2, which

stated that some of the online coping subscales would be adaptive and thus relate positively to well-being and negatively to distress.

Avoidant offline coping. The variable of avoidant offline coping was initially excluded from the structural regression analyses due to poor fit with the models. As a result, the offline coping latent variable in Model 3d predominately appeared to capture adaptive offline coping efforts, as evidenced by the significant positive association between this variable and well-being. This avoidant offline coping variable was included in additional correlational analyses to further explore the relations between avoidant offline coping and attachment, online coping, and adjustment.

Results of correlational analyses demonstrated that avoidant offline coping was significantly positively related to both attachment anxiety ($r = .44, p < .001$) and attachment avoidance ($r = .38, p < .001$). These results provided partial support for hypotheses 1a and 1b. Avoidant offline coping also demonstrated significant positive relations with each of the five online coping subscales (all $ps < .001$, see Table 8) as well as with the Facebook Intensity Scale ($r = .18, p = .004$). Finally, avoidant offline coping was significantly positively related to distress ($r = .48, p < .001$) and significantly negatively related to well-being ($r = -.52, p < .001$). These results provided partial support for hypothesis 2, as individuals who reported more frequent maladaptive offline coping also reported significantly greater distress and significantly less well-being.

Well-being and perceived social support. Examination of alternative Model 4 revealed that greater well-being was associated with increased use of online coping. This finding was surprising given that the results generally suggested that online coping was maladaptive. Correlations between scores on the well-being composite and each of the three perceived social support subscales were conducted to further explore this finding. If

individuals with higher levels of well-being perceived greater social support from their coping efforts, perhaps they more often coped online due to their positive experiences with obtaining social support. Results of these analyses revealed that greater well-being was associated with greater perceived social support from family ($r = .40, p < .001$) and friends ($r = .47, p < .001$) offline. In addition, greater well-being was associated with greater perceived social support from Facebook Friends online ($r = .16, p = .006$).

Summary of Results

Hypotheses one through four were evaluated using final structural regression Model 3d (see Figure 6) and subsequent correlational analyses (see Table 8). Hypotheses 1a and 1b tested the associations between the attachment dimensions of anxiety and avoidance and the variables of offline and online coping. Hypothesis 1a was partially supported. As shown in Model 3d, attachment anxiety was not associated with offline coping but was associated with online coping. Additional correlational analyses revealed a significant positive correlation between attachment anxiety and the avoidant offline coping factor, providing additional partial support for hypothesis 1a. Hypothesis 1b also was partially supported. As predicted, attachment avoidance was negatively associated with adaptive offline coping (as shown in Model 3d) and correlational analyses revealed a significant positive relation between attachment avoidance and avoidant offline coping. Attachment avoidance was not significantly related to online coping in Model 3d, which was inconsistent with the predictions of hypothesis 1b with regard to online coping. However, subsequent correlational analyses revealed positive correlations between attachment avoidance and three of the five online coping subscales, providing additional partial support for hypothesis 1b.

Hypothesis 2 tested the associations between coping and adjustment. This hypothesis was partially supported for offline coping only. As shown in Model 3d, adaptive offline coping was significantly positively related to well-being. Additional correlational analyses revealed a significant positive relation between avoidant offline coping and distress and a significant negative relation between avoidant offline coping and well-being. However, the path between the latent variables of offline coping and distress was nonsignificant, which was inconsistent with hypothesis 2. The results for online coping did not provide support for hypothesis 2, which predicted in part that at least some types of online coping would be associated with improved adjustment. The latent variable of online coping was not significantly related to well-being but was significantly positively related to distress. Additional correlational analyses revealed that each of the five Facebook coping subscales was significantly positively related to distress and three of the five Facebook coping subscales (self-sufficient online, distraction/avoidance, and venting) were significantly negatively related to well-being. The alternative explanation, that individuals higher in distress more often choose to cope on the Internet, was explored through the creation of an alternative model (Model 4) and this reversed path, from distress to online coping, was significant and positive as well.

Hypotheses 3a and 3b tested whether the relations between the attachment dimensions and the adjustment variables would be mediated by offline and online coping choices. The results of Model 3d indicated that greater attachment anxiety and greater attachment avoidance both were directly related to increased distress and reduced well-being. Hypothesis 3a was partially supported in that the relation between attachment anxiety and distress was partially mediated by online coping. However, the valence of these associations was not consistent with hypothesis 3a. As expected, attachment anxiety

was significantly positively associated with online coping. Inconsistent with hypothesis 3a, however, online coping was significantly positively associated with distress. These results did not provide support for a rich-get-richer or a social compensation process and thus did not support either the main or alternative hypothesis for hypothesis 3a.

Hypothesis 3b was partially supported for offline coping only. Results of Model 3d revealed that attachment avoidance was significantly negatively associated with adaptive offline coping, which in turn was significantly positively associated with well-being. In other words, these results suggested that the relation between attachment avoidance and decreased well-being was partially mediated by less frequent use of adaptive offline coping strategies. However, the relation between attachment avoidance and online coping was not significant and thus was not consistent with what the rich-get-richer hypothesis would predict for attachment avoidance.

Hypothesis 4 tested the associations between offline and online coping. The results partially supported hypothesis 4, which predicted correspondence between adaptive coping offline and online as well as between maladaptive coping offline and online. Although examination of final measurement Model 2b indicated that there was virtually no correlation between the latent variables of online coping and offline coping, additional correlational analyses revealed that the variable of avoidant offline coping was significantly positively related to each of the five Facebook COPE subscales, suggesting correspondence in the use of maladaptive coping strategies offline and online.

Hypothesis 5 was assessed by Models 5a and 5b. These models tested the associations between Facebook usage and attitudes and frequency of online coping using Facebook. This hypothesis was supported. Results indicated that greater intensity of Facebook use (i.e., greater usage and more positive attitudes toward Facebook) was

associated with more frequently engaging in online coping strategies via Facebook. Subsequent analyses revealed that each of the five Facebook COPE subscales was significantly positively related to the Facebook Intensity Scale.

CHAPTER V

DISCUSSION

Overview

The purpose of this study was to investigate the associations among attachment, offline coping, online coping, and adjustment in older adolescents and young adults. Participants in this study completed online measures of their attachment anxiety and avoidance, offline coping, and online coping through Facebook to determine whether these variables were associated with their self-reported well-being and distress. They also completed measures of their usage of and attitudes toward Facebook, to determine whether this variable was associated with increased use of Facebook for coping, and measures of their perceived social support from family, friends, and Facebook Friends, which were used to validate the newly created measure of Facebook coping.

Hypotheses 1 through 3 tested the associations among attachment anxiety, attachment avoidance, offline coping, online coping on Facebook, well-being, and distress to determine whether the hypothesized relations between attachment and adjustment were mediated by individuals' coping choices both offline and online, and to examine whether the obtained pattern of results supported either the rich-get-richer or social compensation hypotheses. Overall, portions of hypotheses one through three were supported, as several significant pathways emerged in structural equation models that incorporated these variables. However, the results did not provide direct evidence for either the rich-get-richer or the social compensation hypotheses and suggested that the process of online coping is more complex than can be explained by either of these two hypotheses. There was no indication that online coping yielded benefits for individuals with pre-existing attachment-based strengths or weaknesses. Instead, the results suggested

that online coping is associated with poorer adjustment. Hypothesis 4 tested the associations between offline and online coping and results showed that online coping strategies were significantly associated with the use of avoidant coping strategies offline. Hypothesis 5 tested the associations between intensity of Facebook use (i.e., Facebook usage and attitudes) and online coping, and results showed that greater intensity of Facebook use was related to more frequent use of online coping strategies.

Attachment and Coping

Attachment and offline coping. Hypothesis 1 investigated the relations between the attachment dimensions of anxiety and avoidance and the variables of offline and online coping. The results provided support for the prediction that greater attachment anxiety would be related to greater use of maladaptive offline coping strategies, such as mental and behavioural disengagement. In contrast, the results did not provide support for the prediction that greater attachment anxiety would be related to less use of adaptive offline coping strategies, such as problem-focused, emotion-focused, and support-seeking strategies. With regards to attachment avoidance, the results of the present study provided support for the prediction that greater attachment avoidance would be related to reduced use of adaptive offline coping and greater endorsement of maladaptive offline coping strategies.

These results are consistent with previous research, which has demonstrated that insecure attachment characteristics, such as greater attachment anxiety and/or avoidance, are related to ineffective and avoidant coping strategies, such as substance use, withdrawal, distancing, and escape (Howard & Medway, 2004; Ognibene & Collins, 1998; Seiffge-Krenke & Beyers, 2005; Wei et al., 2006). Researchers also have demonstrated that greater attachment anxiety is associated with greater use of coping

strategies that are impulsive and/or involve denial and avoidance (Jerome & Liss, 2005; Lopez et al., 2001; Wei et al., 2003; Wei et al., 2006). In addition, Lopez and his colleagues (2001) as well as Wei and her colleagues (2006) demonstrated that greater attachment avoidance was related to greater use of coping strategies that involved emotional reactivity and emotional/behavioural suppression, both of which are forms of maladaptive coping. The negative relation between attachment avoidance and adaptive offline coping observed in the present study also is consistent with previous research that has demonstrated that more secure attachment (and thus lower attachment avoidance) is related to more adaptive problem-focused, emotion-focused, and support-seeking coping (e.g., Davis et al., 2003; Greenberger & McLaughlin, 1998; Howard & Medway, 2004; Ognibene & Collins, 1998; Seiffge-Krenke, 2006; Seiffge-Krenke & Beyers, 2005).

These maladaptive patterns of coping may be explained by the negative internal working models of self and/or others that are present in individuals who are high in attachment anxiety and/or attachment avoidance. Individuals who have negative models of self perceive that they are inferior and undeserving, which creates insecurity and anxiety in their attachment relationships (Bartholomew, 1990; Bartholomew & Horowitz, 1991; Griffin & Bartholomew, 1994a). Individuals who have negative models of others believe that others are untrustworthy, aloof, and unavailable. They believe that others will inevitably let them down if they seek closeness or support and so they engage in avoidance in order to protect themselves from the disappointment that they perceive as inevitable (Bartholomew, 1990; Bartholomew & Horowitz, 1991; Griffin & Bartholomew, 1994a).

Negative internal working models of self and others would be expected to interfere with the use of adaptive coping strategies in individuals who are high in

attachment anxiety and/or avoidance for four reasons. First, these individuals may perceive deficits in their capabilities and thus they may not believe that they can solve problems or effectively manage their emotional states. Second, these individuals may perceive deficits in their worth to others and thus they may not believe that they can effectively seek support. Third, they may perceive that others are unwilling or unable to provide useful assistance, and thus they are unlikely to seek support when faced with problems. Finally, these individuals also likely had insufficient modeling, coaching, and reinforcement of effective problem-solving and emotion regulation strategies from important others during childhood due to their decreased identifications with attachment figures (e.g., Ainsworth et al., 1978; Bynum & Brody, 2005; Meesters & Muris, 2004; Seiffge-Krenke, 2006; Seiffge-Krenke & Beyers, 2005). The sense of learned helplessness developed through years of unsuccessful attempts to satisfy needs in relationships with caregivers and reinforced through interactions with other attachment figures throughout development (e.g., Bartholomew & Horowitz, 1991; Bowlby, 1980; Collins et al., 2004; Rholes & Simpson, 2004) makes it unlikely that individuals who are higher in attachment anxiety and/or avoidance would frequently use adaptive coping strategies such as problem-focused, emotion-focused, and support seeking strategies during early adulthood. Instead, the coping repertoire of individuals who are higher in attachment anxiety and/or avoidance may contain more maladaptive and avoidant coping strategies.

Although few attachment researchers have directly assessed the association between internal working models and coping choices, many researchers have suggested that internal working models of the self contribute to behavioural choices, social expectations, and emotional reactions within the context of relationships (e.g.,

Bartholomew & Horowitz, 1991; Bowlby, 1980; Collins et al., 2004; Rholes & Simpson, 2004), and researchers have demonstrated that insecure attachment characteristics are related to avoidant and counterproductive coping strategies (e.g., Howard & Medway, 2004; Lopez et al., 2001; Ognibene & Collins, 1998; Seiffge-Krenke & Beyers, 2005; Wei et al., 2006). Ognibene and Collins (1998) did include measures of working models of self and others and found that negative models of self predicted greater use of escape-avoidance coping in undergraduate students. This finding is consistent with the observed association between attachment anxiety and avoidant offline coping obtained in the present study, and provides support for negative working models of self as the explanatory mechanism behind this association.

In summary, the results of the present study indicated that individuals who were higher in attachment anxiety and individuals who were higher in attachment avoidance demonstrated preference for more maladaptive coping strategies in the real world. The negative internal working models of self and others thought to be present in these more insecurely-attached individuals may have interfered with their learning and use of adaptive coping strategies and resulted in preference for temporary distraction at the expense of long-term solutions. These results were expected given the findings of previous research that has consistently demonstrated poorer coping choices in the real world for individuals who are higher in attachment anxiety and/or avoidance (e.g., Lopez et al., 2001; Howard & Medway, 2004; Ognibene & Collins, 1998; Seiffge-Krenke & Beyers, 2005; Wei et al., 2006). Next, online coping choices were examined to determine whether attachment anxiety and avoidance also related to adaptive and maladaptive coping choices on Facebook.

Attachment and online coping. Given research support for the rich-get-richer hypothesis (Kraut et al., 2002; Lee, 2009; Seepersad, 2004), it was expected that individuals who were lower in attachment anxiety and attachment avoidance would benefit from adaptive online coping choices. Specifically, if individuals who reported *lower* levels of attachment anxiety and attachment avoidance also reported greater use of adaptive online coping strategies and less use of maladaptive online coping strategies, the results would be consistent with the rich-get-richer hypothesis. An alternative hypothesis also was considered, given research support for the social compensation hypothesis (Baker & Moore, 2008; McKenna & Bargh, 1999; Ye, 2007). Specifically, if individuals who reported *higher* levels of attachment anxiety also reported greater use of adaptive online coping strategies and less use of maladaptive online coping strategies, the results would be consistent with the social compensation hypothesis. Partially consistent with hypothesis 1a and 1b, both greater attachment anxiety and greater attachment avoidance each were significantly associated with greater use of four of the five subtypes of online coping (online self-sufficient, distraction/avoidance, use of humour, and venting).

These results were consistent with research that has suggested that attachment characteristics influence how adolescents and young adults use the Internet and social network sites (e.g., Buote et al., 2009; Lei & Wu, 2007; Shin et al., 2011; Siomos et al., 2011; Ye, 2007). Researchers have demonstrated that individuals with insecure attachments are more likely to use the Internet excessively (Lei & Wu, 2007; Shin et al., 2011; Siomos et al., 2011). If these individuals are spending more time online, they also may more often choose to enact coping strategies on Facebook. To the author's knowledge, no previous studies examining the role of attachment in adolescents' and young adults' coping choices on Facebook were available and thus these significant

findings suggest that further investigation into these associations is warranted. It is also necessary to examine the relations between coping and adjustment in order to determine whether this online coping was indeed beneficial and to decide whether the results were consistent with the rich-get-richer or social compensation hypotheses.

Coping and Adjustment

Offline coping and adjustment. With regard to offline coping, hypothesis 2 stated that more adaptive offline coping choices would be related to greater well-being and decreased distress, whereas more maladaptive offline coping would be related to decreased well-being and increased distress. This hypothesis was partially supported. As expected, the results revealed that coping in the real world using problem-focused, emotion-focused, and support-seeking strategies was associated with improved well-being, whereas using avoidant coping strategies in the real world, such as denial and mental or behavioural disengagement, was associated with increased distress and reduced well-being. These results are consistent with a large body of previous research on offline coping, which has demonstrated that adaptive coping choices, such as solving problems, expressing emotions, and seeking social support, are related to better adjustment outcomes, whereas maladaptive coping choices, such as avoidance and aggression, are associated with worse outcomes (e.g., Ben-Zur, 2009; Compas et al., 2001; Rokach, 1990; Suldo et al., 2008; Wilkinson et al., 2000; Wilson et al., 2005).

Online coping and adjustment. With regards to online coping, the results did not support hypothesis 2. It was expected that the types of strategies that were beneficial offline, such as solving problems, managing emotions, and seeking social support, also would be beneficial online, whereas maladaptive and avoidant strategies would be associated with poorer adjustment outcomes in both contexts. Thus it was hypothesized

that some of the Facebook COPE subscales would be associated with increased well-being and decreased distress. However, neither the online coping latent variable nor any of the Facebook COPE subscales were associated with positive adjustment. Instead, greater use of each of the five Facebook coping subscales was associated with increased distress and greater use of three of the five Facebook coping subscales (self-sufficient online, distraction/avoidance, and venting) was associated with reduced well-being. These results were inconsistent with the findings for offline coping and did not support the prediction that some types of online coping would be adaptive. Instead, these results suggested that, overall, online coping was more maladaptive.

Previous research on the outcomes of online coping choices was limited; however, some evidence suggests that online coping could be maladaptive. For example, Seepersad (2004) found that endorsing entertainment as the most preferred use of the Internet was related to greater loneliness. Using the Internet for entertainment can be considered a form of avoidance if used in the context of coping with stressors because it does not involve solving problems or seeking social support. Thus, Seepersad's results could be considered consistent with those obtained in the present study. Kalpidou and her colleagues (2011) also found significant associations between Facebook use and poorer adjustment, although they did not directly examine coping strategies on Facebook. Specifically, they reported that greater use of Facebook was related to decreased emotional adjustment, academic adjustment, and self-esteem in undergraduate students.

Review of the items on the Facebook COPE may provide additional insight into this unexpected finding. Many of the items on the self-sufficient, support-seeking, venting, and humour subscales referred to sharing information about the stressor on Facebook. Perhaps individuals who were sharing information about a stressful event and

their negative feelings with their Facebook Friends were ruminating about the negative experience. Seepersad (2004) found that greater use of rumination as an offline coping strategy was associated with more frequent use of the Internet for entertainment. Researchers have demonstrated that greater rumination is associated with negative adjustment outcomes, such as greater depression and anxiety (e.g., Liao & Wei, 2011). Therefore, perhaps those individuals who were more likely to report coping on Facebook also were more likely to ruminate about their problems and thus experienced greater distress.

In contrast, a larger number of studies have suggested that seeking social support and/or expressing emotions online can result in benefits for social-emotional functioning (e.g., Boniel-Nissim & Barak, 2011; Mauri et al., 2011). These results are inconsistent with the findings of the present study, which indicated that online coping was only related to poorer adjustment outcomes. However, Boniel-Nissim and Barak did not specifically investigate Facebook, and Mauri and his colleagues did not investigate the use of Facebook for coping; instead, participants in both of these studies were assigned ways of using social network sites, and then the results were measured. In the present study, participants reported on their purposeful use of Facebook for coping. These methodological differences may explain some of the inconsistency in the results obtained, and the results of the present study may suggest that purposely choosing to cope on Facebook may represent a different and more maladaptive process than general use of Facebook. In addition, although the results of Mauri and his colleagues' (2011) study indicated that users experienced improvements in their physiological states during general Facebook use, these benefits were transient and disappeared immediately upon presentation of a stress task, suggesting that no long-term benefits were obtained.

Another possible explanation for the positive association between online coping and distress was that the results were better explained in the reversed direction, as was suggested by the analysis of the alternative model. That is, perhaps individuals who were experiencing greater levels of distress more often engaged in coping on Facebook. This interpretation is consistent with the results of Baker and Moore (2008), who found that individuals who had higher depression, anxiety, and stress were more likely to report that they intended to start blogging (which could be considered a form of online coping).

Examination of participants' mean scores on the offline and online coping subscales provides further insight into the direction of influence in the relation between online coping and distress. Overall, the mean scores on the online coping subscales were quite low, and participants reported more frequently engaging in offline coping strategies. Perhaps these participants' first attempts at coping typically involved offline coping, by engaging in problem-focused, emotion-focused, and/or socially-supported coping. Given the positive relation between the adaptive offline coping strategies and well-being, it could be assumed that these efforts were usually successful. However, if these attempts to cope offline were unsuccessful, participants likely would have experienced greater feelings of distress (e.g., greater negative affect, loneliness, depression, anxiety, and/or stress) because their problems would be perceived as more persistent and intractable (e.g., Cleary & Houts, 1984). It also could be the case that the problems individuals were coping with on Facebook were occurring in the future and could not be immediately managed in the real world (e.g., knowing that one's place of employment will be closing in two months). Perhaps these individuals turn to Facebook as a "second wave" attempt to cope. If the problems they were coping with on Facebook were initially more immutable, they would be less likely to successfully resolve them through this method of coping, thus

resulting in increased distress (as demonstrated by the smaller but significant path from online coping to distress in Model 3d). In summary, this explanation suggests that online coping, in and of itself, may not be entirely maladaptive; rather, it could be that participants primarily use Facebook coping to deal with problems that have overwhelmed their real-life coping capacities and/or that are occurring in the future and thus cannot be immediately managed. Future studies should examine the time course of coping offline and online when individuals are faced with stressors in order to further explore this proposition.

This interpretation of the significant path from distress to online coping also is consistent with the findings of Sheldon and his colleagues (2011), who found that greater experience of disconnection (e.g., feeling lonely and unappreciated) was related to increased use of Facebook to cope with these distressing feelings. Use of Facebook, in turn, resulted in increased feelings of connection with others. This temporary experience of connection may be reinforcing for individuals who are experiencing distress; however, the realization that the initial problem has not been solved upon logging out of Facebook may mitigate any transient improvements in mood and result in increased distress. Sheldon and his colleagues also found that those individuals who were higher in disconnection had difficulty reducing or eliminating their use of Facebook, which may explain the magnitude of the path coefficient from distress to online coping. That is, perhaps as individuals experience increases in distress, they become increasingly likely to spend time on Facebook to attempt to cope with their offline problems or negative emotional states.

Another possibility is that individuals who are experiencing greater levels of distress, both emotionally and physiologically, may choose to spend more time coping on

Facebook as a way of regulating their stress responses. This proposition is supported by the results of Mauri and his colleagues' (2011) investigation into physiological changes resulting from time spent on Facebook. They found that Facebook use resulted in a physiological core flow state, characterized by high positive valence and high arousal. If individuals primarily use Facebook to cope with more persistent and unchangeable problems, then it is possible that this momentary relief from distress would be highly reinforcing. However, this physiological state does not persist upon termination of Facebook use (Mauri et al., 2011) and so we would not expect to find a significant directional influence from online coping to well-being; in fact, this nonsignificant path was dropped from the model.

Previous research also supports the suggestion that Facebook use may result in temporary benefits that do not necessarily generalize to users' real-life interactions or adjustment. For example, Baker and Oswald (2010) found that greater use of Facebook in shy individuals was associated with increased feelings of closeness, satisfaction, and perceived social support in relationships with Facebook Friends. However, Facebook use did not have a significant influence on users' levels of loneliness or their comfort in engaging in offline interactions. Overall, they suggested that Facebook use did not result in improvement in users' offline social interactions or well-being, despite contributing to increased feelings of comfort, confidence, and knowledge in online interactions. This interpretation is consistent with the suggestion that Facebook coping does not result in lasting benefits for individuals' levels of well-being.

In addition to the association with distress, the alternative model revealed a surprising finding that there was a significant path from well-being to online coping. This positive relation indicated that participants who reported greater well-being also reported

greater frequency of online coping. In contrast, the reversed direction, from online coping to well-being, was not significant and correlational analyses revealed negative correlations between well-being and most of the Facebook coping subscales.

Perhaps individuals who have higher levels of well-being also use Facebook to cope with more persistent problems, but they do so differently, compared to those who have higher levels of distress. Examination of the indicators of the well-being composite may provide some insight into this unexpected finding. Individuals who rated higher on the well-being composite reported some combination of greater positive affect, self-esteem, sense of purpose in life, and/or sense of life satisfaction. These characteristics tend to be more dispositional or trait characteristics in comparison to the distress indicators of negative affect, depression, anxiety, stress, and loneliness, which tend to be more state characteristics. Perhaps individuals who generally felt better about themselves and about their lives used qualitatively different types of Facebook coping strategies than those who were lower in well-being and/or who were higher in distress, or perhaps they more often perceived that their Facebook use represented efforts to cope with problems rather than viewing it as a pastime or hobby.

Research has demonstrated that individuals who are higher in self-esteem, hope (a type of positive affect), purpose in life, and life satisfaction tend to utilize more effective coping strategies in an offline context (e.g., Danoff-Burg, Prelow, & Swenson, 2004; Fickova, 2000; Smith & Zautra, 2000). Perhaps individuals who are higher in well-being use some of the same general types of strategies as those who are lower in well-being; however, perhaps those individuals who are higher in self-esteem and more optimistic by nature use these strategies in a qualitatively different and more positive/prosocial manner. For example, an individual who is high in well-being and an individual who is low in

well-being both may endorse the venting subscale item, “I let my feelings out on Facebook.” However, the individual who is higher in well-being may post Status Updates about problems that emphasize positive reinterpretation (e.g., “I was just in a car accident but I am so grateful that no one was hurt”) or acceptance (e.g., “I’m sad but I know he is in a better place now”), whereas the individual who is lower in well-being may post updates that focus solely on venting (e.g., “Everything keeps going wrong for me!”). Although the former suggested uses of Facebook for coping are seemingly more adaptive, they would not necessarily immediately result in the resolution of the original problems.

Another possibility is that individuals who had higher self-esteem, sense of purpose, and/or satisfaction with life may have been more likely to perceive that their use of Facebook was a method of coping and thus they were more likely to endorse Facebook COPE items overall. That is, well-being only was related positively to online coping at the multivariate level in the SEM model, indicating higher overall endorsement of items across subscales, whereas negative or nonsignificant correlations were found when examining the relations between well-being and each online coping subscale separately. Researchers have demonstrated that individuals who are higher in self-esteem are more likely to engage in adaptive coping strategies (e.g., Danoff-Burg et al., 2004; Fickova, 2000; Smith & Zautra, 2000). These individuals may perceive that their effective offline coping strategies result in greater social support and, in turn, result in solutions to problems or improvements in mood. Therefore, they may attempt to engage in a variety of coping strategies on Facebook in an attempt to gain additional social support; in other words, perhaps these individuals view all types of coping on a social network site as a means of obtaining social support. In fact, individuals who reported greater well-being also reported greater perceived social support from Facebook Friends, in addition to

reporting greater perceived social support offline from friends and family. However, there was no indication that Facebook coping helped to solve problems or contributed to increased well-being.

The finding that all of the subtypes of online coping were positively associated with distress and some of them were negatively associated with well-being may support the interpretation that greater well-being contributes to more and qualitatively-different types of coping on Facebook overall, but that coping on Facebook results in increased distress and decreased well-being over time. Future researchers should obtain qualitative information regarding the types of coping strategies used by individuals higher and lower in well-being as well as longitudinal data examining the outcomes of online coping choices in order to further explore these suggested explanations.

In summary, the results of the present study demonstrated that greater use of adaptive coping strategies offline was related to improved well-being and that greater use of maladaptive coping strategies offline was related to increased distress and reduced well-being, as predicted by hypothesis 2. However, no support was found for the prediction that some types of online coping would be adaptive and thus demonstrate associations with positive adjustment outcomes. Instead, greater use of each of the subtypes of online coping was associated with increased distress. The results of the present study also suggested that individuals who were experiencing greater levels of distress and well-being more often used coping strategies on Facebook. This use of Facebook for coping may have followed unsuccessful attempts to cope with more persistent problems offline and may be related in part to the transient benefits of Facebook use, such as increased feelings of connection (Baker & Oswald, 2010; Sheldon et al., 2011) and a pleasurable core flow state (Mauri et al., 2011). Participants who were

higher in well-being may have used slightly more adaptive methods of coping online or they may have been more likely to perceive their Facebook use as coping in comparison to individuals lower in well-being. However, the results of the present study did not provide evidence that any type of online coping was beneficial for individuals' adjustment outside the context of Facebook. Qualitative review of participants' Facebook coping use, information about the types of problems they are coping with on Facebook, and longitudinal data collection are necessary to further investigate the nature and direction of the associations among distress, well-being, offline coping, and online coping. Examination of hypothesis 3 is necessary to obtain additional insight into whether individuals' levels of attachment anxiety and attachment avoidance contributed to their state of adjustment, in addition to the role of efforts to cope with problems offline and online.

Attachment, Coping, and Adjustment

Hypothesis 3 investigated whether offline and online coping mediated the relations between attachment and adjustment and whether the observed pattern of results was consistent with the rich-get-richer or the social compensation hypothesis. The results revealed that the relation between attachment anxiety and distress was partially mediated by online coping and that the relation between attachment avoidance and well-being was partially mediated by offline coping. These results provided partial support for hypothesis 3a and 3b, respectively. These mediational pathways are consistent with previous research that has demonstrated that maladaptive offline coping choices mediate the relation between insecure attachment characteristics and negative adjustment outcomes (e.g., Birnbaum et al., 1997; Landen & Wang, 2010; Lopez et al., 2001; Turan et al., 2003; Wei et al., 2003; Wei et al., 2006).

Inconsistent with the predictions of hypotheses 3a and 3b, the results of the present study also revealed significant direct associations between attachment and adjustment. Individuals who were higher in attachment anxiety and individuals who were higher in attachment avoidance reported greater distress and reduced well-being. There is a large body of research that supports the association between insecure attachment characteristics and more negative psychosocial adjustment (e.g., Mallinckrodt & Wei, 2005; Roberts et al., 1996; Wei et al., 2003), in contrast to the positive adjustment outcomes for those individuals who are more securely attached (those who are low in both attachment anxiety and avoidance; e.g., see Jones & Cunningham, 1996; Pielage et al., 2005; Pistole, 1989; Shi, 2003; Simpson & Rholes, 2004; Wei et al., 2005).

The mediational pathways from attachment to online coping to adjustment were of particular interest in testing the rich-get-richer and social compensation hypotheses. The rich-get-richer hypothesis (Kraut et al., 2002) would suggest that individuals with pre-existing social-emotional strengths -- such as those with low attachment anxiety, low attachment avoidance, and/or well-developed adaptive offline coping skills -- would derive greater benefit from coping on the Internet. The social compensation hypothesis (Kraut et al., 2002) would suggest that individuals with few pre-existing social-emotional strengths, such as those with high attachment anxiety and/or poor offline coping skills, would derive greater benefit from coping on the Internet. Both of these hypothesized processes imply that some uses of the Internet are beneficial for users and it was expected that some types of online coping would result in increased well-being and decreased distress. However, the results of the present study do not provide direct support for either the rich-get-richer or the social compensation hypotheses. Instead, using Facebook for coping appeared to be related, overall, to increased distress and reduced well-being.

Furthermore, the results of the present study appear to indicate a “poor-get-poorer” process for individuals high in attachment anxiety, as their greater use of maladaptive online coping choices was related to increased distress, above and beyond the direct positive relation between attachment anxiety and distress, and in addition to their greater use of avoidant offline coping strategies. The positive relation between attachment anxiety and online coping also indicates that individuals who reported lower attachment anxiety also reported less use of maladaptive online coping strategies. This pattern of results indirectly supports the rich-get-richer hypothesis, because these individuals were avoiding a behaviour that otherwise would have been detrimental to their adjustment. In other words, individuals with pre-existing attachment-based strengths (i.e., low attachment anxiety) seldom chose to cope online, which may have prevented them from experiencing increases in distress.

Taken together, the results for hypotheses 1 through 3 suggest that attachment, offline coping, online coping, and adjustment may be related in the following ways. First, individuals who are higher in attachment anxiety and/or attachment avoidance experience increased distress, reduced well-being, and difficulty coping effectively with problems offline, due in part to their negative internal working models of self and/or others (Bartholomew, 1990; Bartholomew and Horowitz, 1991; Griffin & Bartholomew, 1994a). At times, these limited offline coping efforts fail, either due to the ineffectiveness of the coping strategies attempted or due to the difficult nature of the problem. Therefore, these individuals would continue to experience high levels of distress, which may motivate them to turn to online coping on Facebook as a second context in which to cope. Previous research has demonstrated that Facebook use may result in transient improvements in mood, affect, physiological functioning, and perceived social support and thus may be

very reinforcing (e.g., Baker & Oswald, 2010; Mauri et al., 2011; Sheldon et al., 2011). Results obtained in the present study also demonstrated that greater use of each of the five subtypes of online coping was associated with greater perceived social support from Facebook Friends. However, as of yet there is no research evidence that coping on Facebook results in long-term solutions to problems or persisting positive changes to mood states. As a result, using Facebook to cope may be associated with the continued experience of distress and reduced well-being.

This model suggests that distress motivates Facebook use and Facebook use may temporarily relieve, or at least distract from, distress. Because Facebook use does not appear to help solve problems or result in lasting changes to users' emotional states, individuals would be expected to re-experience distress as soon as they log out of Facebook. This increase in distress may motivate further use of Facebook. This cycle of avoidance and reinforcement may help explain the increasing phenomenon of Internet addiction or pathological Internet use (e.g., Spraggins, 2011; Widyanto & Griffiths, 2006). Widyanto and Griffiths (2006) described Internet addiction as a behaviourally-based addiction that involves traditional components of both behavioural and chemical addictions, such as reinforcing properties, primary importance to the user, changes in mood, development of tolerance, symptoms of withdrawal when use is discontinued, and high likelihood of relapse because of all of these factors.

Spraggins (2011) found that some undergraduate students reported problematic use of social network sites, including Facebook, and that this problematic use was related to greater social anxiety, loneliness, and depression, as well as reduced self-esteem, life satisfaction, and happiness. However, Spraggins did not examine how this pathological social network site use develops. One possibility is that the use of Facebook to cope with

distress would be both negatively reinforced (by providing a source of distraction/avoidance and thus decreasing negative affect; e.g., Pempek et al., 2009) and positively reinforced (because the experience of using Facebook is pleasurable; Mauri et al., 2011; Sheldon et al., 2011).

Previous studies have demonstrated that attachment characteristics, such as insecurity in attachment relationships, are related to pathological use of the Internet (e.g., Khosroshahi, Nosrat, & Toraj, 2012; Lei & Wu, 2007; Shin et al., 2011). Individuals who are high in attachment anxiety may fare particularly poorly. In the present study, attachment anxiety was related to online coping directly, in addition to being related indirectly to online coping through increased distress. Individuals who are higher in attachment anxiety may choose to engage in online coping strategies when first encountering a problem and when experiencing increased distress, in comparison to the coping choices of individuals who are lower in attachment anxiety/avoidance, who may only turn to online coping when their initial adaptive offline coping efforts are unsuccessful. Perhaps individuals who are higher in attachment anxiety are attempting to compensate for their social weaknesses by frequently engaging in coping on a social network site.

Previous research has demonstrated that individuals with pre-existing social weaknesses can benefit from using the Internet (e.g., Baker & Moore, 2008; Baker & Oswald, 2010; Bessière et al., 2008; Boniel-Nissim & Barak, 2011; Sheldon et al., 2011), so the finding that individuals with pre-existing attachment-based weaknesses actually may fare worse if they choose to cope online was surprising. The subtypes of online coping strategies, such as self-sufficient problem-solving and seeking social support, were developed to parallel the subtypes of offline coping that are often found to be adaptive in

research studies (e.g., Ben-Zur, 2009; Suldo et al., 2008; Wilkinson et al., 2000). In fact, when used offline, these subtypes were significantly associated with greater well-being in the present study. Despite these efforts to include items that represented adaptive online coping, all online coping subscales appeared to represent maladaptive coping choices. It is important to examine the relations between offline and online coping in order to better understand these counterintuitive findings.

Offline and Online Coping

Hypothesis 4 stated that individuals would choose similar coping strategies offline and online and thus significant positive relations would be observed between adaptive offline coping and adaptive online coping, as well as between maladaptive offline coping and maladaptive online coping. Results indicated that there was virtually no correlation between the use of adaptive offline coping strategies and use of online coping. However, greater use of avoidant offline coping strategies was associated with greater use of each of the five Facebook COPE subscales. Although these relations were unexpected (in that some of the Facebook COPE subscales were expected to be associated with adaptive offline coping), these results were consistent with the hypothesized positive relation between maladaptive coping in both contexts.

The finding that there was almost no correlation between the latent variables of offline and online coping in Model 2b was surprising and provided further support that in this study online coping, overall, was maladaptive. The measure of offline coping used in this study (the COPE) was chosen because it represented a dispositional measure and thus was designed to capture individuals' coping efforts across situations (Carver et al., 1989). Furthermore, the items on the Facebook COPE were developed to parallel the items on the COPE, which also was expected to contribute to cross-situational consistency between

the subtypes of coping. It was assumed that the Internet would represent a new context in which individuals could use the same types of coping strategies and accrue the same types of benefits. However, the nonsignificant correlation between offline and online coping obtained in Model 2b indicated that this assumption was not supported. In contrast, correlational analyses indicated that greater use of avoidant offline coping was associated with greater use of each of the five Facebook COPE subscales, suggesting that cross-situational consistency in coping choices applied only to more maladaptive and avoidant strategies.

Previous research examining the relations between offline and online coping was limited, but the results of the present study are consistent with those of Seepersad (2004), who found that preferring to use the Internet for entertainment was associated with preference for using avoidant coping strategies offline. Many of the Facebook COPE items could be conceptualized as representing entertainment and/or avoidance. For example, using Facebook for self-sufficient online coping, venting, and humour could serve the purposes of distracting an individual from a stressor and providing a source of entertainment. It also was suggested that many of the online coping strategies may involve ruminating about a stressor. Even coping strategies that are typically beneficial offline, such as planning and active coping, may not be as adaptive online because it would be difficult to actually solve many problems on Facebook. For example, if a student is worried about an upcoming test, posting about their plans to study on Facebook and actually studying are two very different types of coping strategies.

Furthermore, researchers have begun to demonstrate that concerns about self-presentation are related to how individuals use Facebook, such that many Facebook users are more motivated to present themselves positively than to present themselves honestly

(e.g., Buffardi & Campbell, 2008; Kim & Lee, 2011; Mehdizadeh, 2010; Rosenberg & Egbert, 2011). Some individuals may be reluctant to use Facebook, an inherently public and social website, in ways that are honest and genuine due to concerns about the impression they are making on others. If individuals are reluctant to admit that they are struggling, that they made a mistake, that they failed at some pursuit, and/or that they need assistance, they would be expected to less often engage in coping strategies on Facebook that put their deficits on display. These concerns about self-presentation may help to explain the low endorsement of many of the Facebook COPE items.

It is important to note that the online coping subscale of direct support seeking (directly seeking conversation, discussion, and/or private communication through Facebook as a method of coping) demonstrated slightly different patterns of associations with the other variables of interest. Specifically, direct support seeking was not significantly related to attachment anxiety, attachment avoidance, or well-being. The relation between this subscale and distress, though significant, was lower than the correlations between distress and each of the other four Facebook coping subscales. Given the strength of the path from distress to online coping, it is suggested that this reversed direction may explain a portion of the observed correlation between distress and directly seeking support; that is, perhaps individuals who were experiencing greater levels of depression, anxiety, stress, loneliness, and/or negative affect were more likely to seek support by sending Private Messages or using Facebook Chat. The lack of significant associations between direct support seeking and the attachment variables precludes support for either the rich-get-richer or social compensation hypotheses, and the results of this study do not provide clear evidence that this online support seeking was maladaptive or adaptive. However, the different pattern of associations among direct support seeking,

attachment, and well-being suggest that a different process may be occurring in comparison to the other four subtypes of Facebook coping. Future research should continue to explore the predictors and outcomes of directly seeking support online in the context of longitudinal studies in order to clarify these relations.

Based on the rich-get-richer hypothesis, it would be expected that individuals with well-developed adaptive offline coping strategies also would report using the Internet for coping in ways that had positive implications for their adjustment. The results of the present study did not support this proposition. However, the finding that individuals who were less likely to engage in avoidant coping strategies offline also were less likely to engage in coping on Facebook provides indirect evidence for the rich-get-richer hypothesis. That is, individuals who were knowledgeable enough to minimize their use of avoidant coping strategies offline also reported minimal use of online coping strategies. Because these online coping strategies were associated with distress, this choice was adaptive.

In summary, the results of the present study demonstrated that greater use of avoidant offline coping was significantly associated with each of the five subtypes of online coping, providing partial support for hypothesis 4, which predicted consistency in individuals' offline and online choices. The latent variable of adaptive offline coping was not significantly associated with the latent variable of online coping, contrary to the predictions of hypothesis 4. The finding that none of the online coping subtypes were associated with adaptive offline coping was surprising because of the parallels between the measures of offline and online coping used in this study. Two possible explanations for this unexpected finding were proposed. First, most types of online coping may involve avoidance of real-life problems. Second, concerns about self-presentation may interfere

with honest, and therefore more adaptive, attempts to cope with problems on Facebook. The results of this study also suggested that additional research into directly seeking social support through Facebook is warranted given indications that this subtype of online coping may not be as detrimental as the other four subtypes and may result in increases in perceived social support from Facebook Friends. Given the relatively low endorsement of online coping, examination of additional variables that may predict greater use of Facebook for coping would be informative.

Facebook Usage and Attitudes

Hypothesis 5 stated that individuals who reported greater Facebook usage and more positive Facebook attitudes would more frequently engage in online coping using Facebook. The results indicated that greater intensity of Facebook use (i.e., greater time spent on Facebook per day, greater number of Friends, and more positive attitudes toward Facebook) was associated with more frequently engaging in online coping strategies via Facebook. Subsequent analyses revealed that each of the five Facebook COPE subscales was significantly positively related to the Facebook usage/attitudes scale. All of these results support hypothesis 5.

Previous research investigating the associations between Facebook usage and attitudes and frequency of engaging in coping on Facebook was not available, although Nicholas and his colleagues (2007) demonstrated that holding negative attitudes toward general online socializing was associated with reduced likelihood of engaging in online support seeking. The findings obtained in the present study also are somewhat consistent with research on offline coping, which has found that more frequent contact with and more positive attitudes toward a source of social support is associated with greater likelihood of coping by seeking support from that source (e.g., Le Mare & Sohbat, 2002;

Lopez et al., 1998). Coping on Facebook is inherently reinforcing because it results in pleasurable feelings during use (Mauri et al., 2011; Sheldon et al., 2011) and because it temporarily reduces distress (Sheldon et al., 2011). These dual sources of reinforcement would be expected to increase frequency of use and positivity of attitudes toward Facebook, as well as increasing the frequency of coping with stress by using Facebook.

Therefore, individuals who reported more frequent Facebook use and more positive attitudes toward Facebook also reported more often engaging in coping strategies on Facebook, even though there was no evidence that these online coping strategies were beneficial in the longer-term. These findings are consistent with the literature on addiction to the Internet in general (e.g., Tsai & Lin, 2001), as well as the literature on other addictive behaviours, such as gambling (e.g., Kerber, 2005), which has demonstrated that more frequently engaging in a behaviour as well as more positive attitudes toward that behaviour are risk factors for subsequent addiction or pathological use. For example, Tsai and Lin (2001) found that adolescents who used the Internet more frequently and who more highly valued the Internet were more likely to demonstrate symptoms of Internet addiction. Future researchers should continue to investigate whether frequent and enthusiastic Facebook users are at higher risk for pathological Facebook use.

In summary, the results of the present study supported the hypothesis that greater intensity of Facebook use would be related to more frequently engaging in coping on Facebook. This association may be explained by the reinforcing nature of using Facebook for coping, as this feature may contribute to more positive attitudes toward Facebook and more frequent use of Facebook, both in general and for coping. Longitudinal research is needed to determine whether the reinforcing nature of Facebook puts users at risk for the

development of pathological Facebook use or whether some users can derive longer-term benefits from some types of online coping.

Limitations and Future Directions

Although this study had many strengths, it is also important to acknowledge its limitations. The challenges of using a newly-created measure of online coping through Facebook may be considered a limitation of this study. However, no previously-validated measures existed. Previous research (e.g., Mauri et al., 2011; Sheldon et al., 2011), discussions with students, and informal observations strongly suggest that young adults do use Facebook for coping purposes. The results of this study indicated that the five retained factors of the Facebook COPE each demonstrated very good to excellent reliability. Preliminary evidence for the convergent and discriminant validity of this measure was obtained as the subscales derived from this measure correlated in expected ways with a measure of perceived social support. The results of correlational analyses provided additional support for the validity of the Facebook COPE as a measure of online coping, rather than simply being another measure of Facebook use. That is, the correlations between overall Facebook usage and attitudes and each of the Facebook COPE subscales generally were in the small to moderate range, suggesting that some aspects of Facebook coping were not being accounted for solely by Facebook use. In addition, the composite variables of well-being and distress demonstrated virtually no correlations with Facebook usage and attitudes, whereas three of the five correlations between the Facebook coping subscales and well-being and all five of the correlations between the Facebook coping subscales and distress were significant. These results suggested that using and valuing Facebook in and of itself did not contribute to users'

well-being or distress. However, using Facebook to cope with stressors was significantly associated with reduced well-being and increased distress.

Additional evaluation of the Facebook COPE measure would be useful for future studies examining online coping. The results of the present study suggested that 12 items be removed from the Facebook COPE, including two items referring to the use of Applications. However, given the relatively low sample size and skewed distributions of the items observed in the current study, the functioning of these items may be improved in a future study that addresses these limitations. The use of Applications on Facebook is extremely popular, and thus further investigations should focus on how individuals may use Applications to cope, rather than simply excluding these items altogether. There are over nine million Applications/links on Facebook currently, so it is necessary to specify the type of Application being used when asking questions about coping. Future research using this measure also should seek to provide further evidence of reliability (e.g., test-retest), as well as convergent validity (e.g., comparison with coping choices on other social network sites) and discriminant validity (e.g., distinction between using Facebook to cope from using Facebook for other purposes). Qualitative examination of participants' coping strategies on Facebook would be useful to validate the Facebook COPE items and to generate ideas for additional online coping questions. Examination of the types of feedback provided by Facebook Friends in response to coping attempts on Facebook (e.g., the content of Comments or Messages from Friends in response to an attempt to elicit social support) may provide additional insight into the process and outcomes of coping on Facebook. However, privacy concerns may limit this type of investigation.

Recently, researchers have recommended using dimensional approaches to conceptualize and measure attachment (e.g., Fraley & Waller, 1998; Kurdek, 2002; Ross

et al., 2006) and this approach was used in the current study. However, the decision to measure attachment anxiety and attachment avoidance, rather than to group participants into categorical attachment styles, may have implications for the pattern of results. Although the choice of a dimensional approach was appropriate for this investigation of a normative undergraduate student sample, researchers investigating samples with greater diversity in attachment styles may find different relations among attachment, online coping, and adjustment if a categorical approach is used. Using a dimensional approach enables researchers to examine how attachment variables are related to other variables of interest. Using a categorical grouping would allow researchers to examine combinations of high and low attachment anxiety and avoidance to determine how individuals with different attachment styles cope online and to explore the implications of this online coping for adjustment. Future researchers should use both categorical and dimensional approaches in measuring attachment within more diverse samples to determine whether the results obtained in this study generalize to different populations.

Another possible limitation concerns the items on the Perceived Social Support Scale – Facebook Friends (PSS-Fb) scale created for this study. The items on this scale were derived from the items on the family scale of the PSS (PSS-Fa). This scale was chosen for adaptation because, compared to the friends scale of the PSS (PSS-Fr), the PSS-Fa items more closely resembled the types of social support that could be obtained using Facebook. However, two items on the PSS-Fr differed from those on the PSS-Fa (i.e., “I feel that I am on the fringe in my circle of friends”; “If I felt that one or more of my friends were upset with me, I’d just keep it to myself”), and thus information concerning perceived social support in these domains was not available. Given that it is likely that there was considerable overlap between participants’ offline friends and

Facebook Friends, it is possible that the exclusion of these (reverse-scored) items contributed to the relatively lower mean scores on the PSS-Fb scale. Future researchers could include these two items from the PSS-Fr scale when assessing perceived social support from Facebook Friends in order to examine whether inclusion of the items contributes to increased mean scores and different patterns of relations with online coping.

Another limitation of this study is the method of data collection. Data were collected from each participant on only one occasion and through only one method -- online, self-report questionnaires. This methodology has frequently been used in studies of social network site usage (e.g., Muise et al., 2009; Kalpidou et al., 2011; Kujath, 2011; Sheldon et al., 2011). However, the direction of causal influence in the relations between online coping and adjustment cannot be stated definitively using this approach. This study found support for both possibilities. That is, it is possible that engaging in online coping using Facebook increases distress, and it is possible that individuals' levels of distress and well-being influence their frequency of this type of online coping. Longitudinal research is required to determine whether online coping choices cause increases in distress, whether levels of distress (or well-being) cause increases in online coping, or whether these influences are indeed reciprocal.

Self-report questionnaires also may present problems through biases and memory limitations. It may be helpful for future researchers to cross-validate participants' self-reported attachment and adjustment ratings through observational methodologies, interviews, and/or through the reports of a close peer or family member. Many participants denied engaging in the Facebook coping strategies presented, despite the

conflicting evidence available from informal observations and discussions of students' Facebook use. Access to individuals' Facebook accounts could provide more valid and reliable measures of Facebook use and coping strategies, but privacy concerns may be a challenge for researchers seeking to access this information. In addition, counterbalancing the order of the measures presented to participants could enable researchers to rule-out order effects as a contributor to the pattern of results.

The use of modification indices in model-testing and model-fitting could be considered a limitation in the data analyses used in this study. Specifically, some cross-loadings and error covariances were added to the a priori SEM models used to test the hypotheses of this study. Although this approach was used conservatively, in that additional paths were required to meet four criteria to be included in the model and changes to the models did not solely rely on modification indices, it is important to note that the use of modification indices has the potential to over-fit a model to a particular data set. Future researchers should attempt to replicate the results of the present study with and without the particular cross-loadings and covariances included in this study in order to determine whether the SEM results generalize to additional samples.

The sample of this study consisted of 17- to 25-year-old undergraduate students enrolled in psychology courses at one university. This resulted in a sample with restricted variability in demographic characteristics, and the majority of participants were Caucasian, female, and unmarried. Most participants reporting having had Internet access for six or more years, and thus it was likely that most of the sample had used the Internet throughout their adolescence. However, these demographic patterns may have contributed to the results obtained in the present study. For example, older adults who did not grow

up with Internet access and/or who are married may use the Internet for coping in ways that are different from the present sample. Perhaps these older individuals, who only engaged in coping strategies offline for most of their lives, would more often choose similar strategies online, and thus the relations between adaptive online and offline coping would be significant in this group. In addition, the results may have differed in a sample with a different gender balance. Current research suggests that males may use social network sites less than females (e.g., Tufekci, 2008), and in fact this difference was found in the present study. Although gender differences did not appear to play a significant role in the current sample, future studies should examine possible gender differences in the relations among attachment, offline coping, online coping, and adjustment.

It is important to note that Facebook was originally designed by and for university students (<http://newsroom.fb.com/content/default.aspx?NewsAreaId=20>), and most researchers who have examined Facebook and other social network sites have done so with university students, in part because the use of Facebook is nearly ubiquitous in this population (e.g., Kalpidou et al., 2011; Muise et al., 2009; Pempek et al., 2009; Sheldon et al., 2011). The results of this study indicated frequent and intensive use of Facebook among the undergraduate students surveyed. To the author's knowledge, the present study represented the first empirical investigation of the relations among attachment, online coping, offline coping, and adjustment. Given that the associations of interest in this study had not yet been examined in any population, using a sample of predominately female undergraduate students, who typically report frequent use of Facebook and for whom many previous studies have examined their use of social network sites, appeared to be the

ideal starting point for research into these relations. Given that coping on Facebook was associated with many important variables in this study, such as attachment anxiety, distress, and avoidant offline coping, this line of research should be continued and expanded. Future research in this area should collect data from a sample with more diverse characteristics that span all levels of education, income, relationship statuses, and cultural backgrounds. A more gender-balanced sample could allow researchers to investigate whether the relations found in this study differ by gender. It also would be informative to obtain measures from younger children and adolescents, as well as older adults, to see if the relations among attachment, coping, and adjustment differ across cohorts.

Finally, the present study limited its investigation of online coping to strategies implemented on Facebook only. Webpages tracking usage of social network sites report that Facebook continues to be the most popular social network site as measured by number of visitors and amount of “traffic” (such as content uploaded and downloaded to a site; e.g., <http://www.ebizmba.com/articles/social-networking-websites>). Furthermore, participants in the current study reported frequent and intensive use of Facebook and the vast majority reported using Facebook exclusively or more than any other social network sites. These results provided support for the decision to focus exclusively on Facebook use and Facebook coping. However, many other social network sites such as Twitter (www.twitter.com), LinkedIn (<http://ca.linkedin.com/>), and Google+ (<https://plus.google.com>) are extremely popular with older adolescents and young adults, with users estimated to be in the hundreds of millions. Future studies could examine whether adolescents and adults are using these websites for coping. If so, it would be important to investigate whether these online coping choices on other social network sites

are similar to the results for Facebook coping, in terms of types of strategies enacted online, associations with attachment, and implications for adjustment.

Conclusions and Practical Applications

In conclusion, the findings from this study suggest that attachment-related anxiety and avoidance predispose individuals to experience less optimal adjustment outcomes and to cope with problems in less adaptive ways, both offline and online. Neither the rich-get-richer nor the social compensation hypothesis was fully supported, although there was indirect support for the rich-get-richer hypothesis in that individuals who reported lower attachment anxiety appeared to benefit from not engaging in maladaptive online coping strategies. Overall, the results of this study suggest a two-step model of Facebook coping in that distress serves as a motivation to cope on Facebook and that the use of Facebook for coping is inherently reinforcing, but may not solve problems or reduce distress in the longer term.

This model also suggests that particular subgroups of Facebook users may be at greater risk for pathological use. Individuals who have high attachment anxiety; poor offline coping skills; greater depression, anxiety, stress, loneliness, and/or negative affect; more frequent Facebook usage; and/or more positive attitudes toward Facebook may be more inclined to rely on the temporary escape from their problems that Facebook provides. Additional research is needed to determine whether these characteristics are indeed related to Facebook addiction so that this can inform prevention and intervention efforts. Given that attachment characteristics are seen as relatively fixed by the time individuals reach late adolescence and early adulthood (e.g., Fraley, 2002), these results suggest that intervention efforts focused on the development and implementation of healthy coping habits may improve the psychosocial adjustment of individuals who have

more insecure attachment characteristics. It appears that improving individuals' use of problem-focused, emotion-focused, and support-seeking strategies and decreasing their reliance on distraction and avoidance strategies in an offline context may be beneficial for adjustment. Based on the results of the present study, it does not appear that coping on Facebook is helpful, particularly for those types of Facebook users perceived to be at higher risk for pathological use. Future research will inform whether these recommendations should be retained or modified.

This study is one of the first investigations into the role of attachment in offline and online coping choices and the implications of these coping strategies for psychosocial adjustment. Several important findings emerged that can be used to guide future research and can ultimately contribute to attachment, coping, and Internet use theory. Further, this knowledge can be used to educate adolescents, young adults, parents, and clinicians about the coping strategies that are likely to be most effective for individuals with particular attachment characteristics. Additionally, these results have contributed to our knowledge about the correlates and consequences of social network site usage. This information can be used to educate consumers about how best to use social network sites, as well as what to avoid, when using the Internet to manage stressors. Overall, these results have contributed to a more comprehensive understanding of how older adolescents' and emerging adults' pre-existing attachment-based differences may influence the decisions they make when dealing with stress. Through this knowledge, we can assist these individuals in making the best decisions for their psychosocial adjustment, both in the real world and in the virtual world that has become a part of their daily lives.

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Appendix A: Demographics

1. What is your gender?

Male Female Transgender Other

2. What is your age?

_____ Years _____ Months

3. What grade/year are you in?

High School: 9 10 11 12
University: 1st 2nd 3rd 4th 5th 6th Other
Not in School

4. How do you describe your ethnicity?

Caucasian/White African American/Black Aboriginal/Native Canadian
Asian/Pacific Islander Latin American Multiracial Other

5. What is your current relationship status?

Single Dating Married Engaged Common-Law
Separated/Divorced Widowed

6. If you are currently in a romantic relationship, approximately how long have you been in this relationship?

_____ Years _____ Months

7. Regardless of your current relationship status, how long did your longest romantic relationship you have ever had last?

_____ Years _____ Months

8. Which of the following best describes your current living situation?

With parents With roommate(s), non-romantic Alone With romantic partner

9. Have you been diagnosed with any of the following psychological or developmental disorders within the past 5 years? Please check all that apply:

Attention Deficit-Hyperactivity Disorder (ADD/ADHD)
Autism, Autistic Disorder (ASD), or Asperger's Disorder

Bipolar Disorder

Learning Disability

Major Depression or Depression

Generalized Anxiety Disorder (GAD)

Obsessive Compulsive Disorder (OCD)

Social Anxiety/Social Phobia

Specific Phobia

Other (please list) _____

Appendix B: Consent Form/Letter of Information

CONSENT TO PARTICIPATE IN RESEARCH

Title of Study: Young Adults' Use of Facebook

You are asked to participate in a research study conducted by Jaime Arseneault, M.A. and Dr. Kimberley Babb (faculty supervisor) from the Department of Psychology at the University of Windsor. The results of this study will contribute to the completion of the doctoral dissertation of the first researcher. This research is supported in part by a Vanier Canada Graduate Scholarship awarded to the first researcher by the Social Sciences and Humanities Research Council (SSHRC) of Canada.

If you have any questions or concerns about the research, please feel to contact Jaime Arseneault at uwindsor.facebook@gmail.com or Dr. Kimberley Babb, at kbabb@uwindsor.ca.

Please note that this consent form serves as your letter of information and you can print it directly from this screen in order to keep a copy for your records.

PURPOSE OF THE STUDY

The purpose of this study is to examine how young adults aged 17 to 25 years are using Facebook. Specifically, the study will look at the relations among individuals' offline and online relationships, their offline and online coping choices, their well-being, their distress, and their use of different Facebook features such as personal information (e.g., photos, Status Updates), communication tools (e.g., Wall, Messages, Chat), and Applications.

PROCEDURES

If you volunteer to participate in this study, you will be asked to enter your uwindsor e-mail address in order to access the survey. The system will then assign you an access code. If you accidentally close the survey, you can use your access code to return to the last page completed. You will be asked to complete 12 different pages of questions using your mouse and keyboard to click on or enter your responses. The questionnaires will ask about your use of Facebook features and Applications, your offline and online relationships, and your offline and online coping choices. The questionnaires will also ask about your positive and negative feelings, as well as your self-esteem, life satisfaction, depression, anxiety, stress, and loneliness. It is anticipated that this survey will take no more than one (1) hour to complete. Because this is an online study, you can participate in any location where you have access to the Internet, such as at home or at school.

POTENTIAL RISKS AND DISCOMFORTS

There are no known risks associated with this research, and it is unlikely that you will experience distress resulting from your participation in this research. However, if this does occur, or if you have concerns of a more personal nature, there are resources available on campus. If you think it might be useful or if you are in distress, the Student Counselling Centre on campus provides assistance and support to students free of charge. Visit <http://www.uwindsor.ca/scc> rm. 293 CAW; (519) 253-3000 Ext. 4616; OR contact

the Psychological Services Centre at 326 Sunset Avenue; telephone: (519) 973-7012 or Ext. 7012.; More information can be found at http://web2.uwindsor.ca/psych_centre/index.htm

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

This research is expected to provide insight into how young adults are using Facebook, and whether this Facebook use is beneficial or harmful for people your age. These findings may, in turn, benefit society by helping us to understand how people can use Facebook as a beneficial tool, while preventing harmful uses.

COMPENSATION FOR PARTICIPATION

If you are enrolled in a Department of Psychology course that offers bonus points for participating in psychology research studies, you will receive 1.0 bonus credit point for completing this 60-minute survey. You must be signed up for a timeslot in order to receive compensation. Credit will be assigned within 48 hours of the completion of the last questionnaire. However, to obtain these credits, you must complete at least 90% of the online questions. If you do not complete at least 90% of the questions or you do not formally withdraw from the study by clicking the "WITHDRAW FROM STUDY" link located on each webpage, you will forfeit your bonus points.

CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. The information collected will be stored on an electronic database, independently of your name and e-mail address. This data will be stored in a password-protected file, which only the researchers involved in this study can access. When downloaded for analysis, the data will be encrypted and stored electronically on a secure computer. In accordance with the American Psychological Association, your data will be kept for five years following the last publication of the data.

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 choose not to answer any questions you don't want to answer and still remain in the study. If you choose to formally withdraw from the study, you must click on the "WITHDRAW FROM STUDY" link located on each webpage in order to receive your bonus mark. Your data will be destroyed but you will still receive compensation.

After you participate, if you decide that you want your data to be removed from the study, you must e-mail the researchers (uwindsor.facebook@gmail.com) prior to the end of the project. After the project is complete (estimated to be in November, 2011), the file which connects participants' names to their data will be destroyed to ensure anonymity of research participants. As such, it will be impossible to identify and remove your data after that time.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS

All the data we collect are examined in groups and by taking averages so we cannot give individual results to people. However, study results will be made available through

www.uwindsor.ca/reb (click on "Study Results" then "Participants/Visitors") and will be available as of November 1, 2011.

SUBSEQUENT USE OF DATA

These data may 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; email: ethics@uwindsor.ca

SIGNATURE OF RESEARCH SUBJECT/LEGAL REPRESENTATIVE

By clicking the button below, I indicate my understanding of the information provided for the study "Young Adults' Use of Facebook" as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I agree to print or request an email copy of this page for my records. To request an email copy, please contact uwindsor.facebook@gmail.com.

PRINT THIS DOCUMENT FOR YOUR RECORDS

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

Signature of Investigator: Jaime Arseneault

Date: November 1, 2010

- I consent to participate in this research
 I DO NOT consent to participate in this research

PLEASE ENTER YOUR UWINDSOR E-MAIL ADDRESS BELOW TO ACCESS THE SURVEY:

_____@uwindsor.ca (this will be used to generate your personal ID, make it possible to retrieve your ID, and to assign your bonus point credit)

Submit and Continue

VITA AUCTORIS

Jaime M. Arseneault was born in 1982 in Windsor, Ontario. She graduated from Sandwich Secondary School in 2001. She completed her undergraduate education at the University of Windsor, where she obtained the degree of Bachelor of Arts in Honours Psychology with Thesis in June of 2005, With Great Distinction. She obtained a Master of Arts degree in Child Clinical Psychology in 2007 at the University of Windsor. She will be receiving the Doctor of Philosophy degree in Child Clinical Psychology at convocation in October 2012.