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Loneliness and Online Friendships in Emerging Adults

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Research Highlights

- The social compensation hypothesis argues the Internet attracts lonely people
- The mechanism by which lonely emerging adults make online friendships is unclear
- Social loneliness was related to social compensation motives
- Romantic loneliness was related to social compensation and networking motives
- Motives predicted friendships via online communication and self-disclosure

Abstract

We examined the relationships between loneliness, interpersonal motives for Internet use, online communication, and friendships on Social Networking Sites (SNS) in emerging adults. Participants were 1st-year university students (N = 149; M_{age} = 20.33 years; SD = 2.51). Social and romantic (emotional) loneliness were indirectly related to the total number of friends reported on SNSs via social compensation and social networking motives and mechanisms of spending more time in online communication and engaging in more self-disclosure. Romantic loneliness was indirectly related to the number of new friends made on SNSs via social networking motives and online communication. These different relationships show that to understand the mechanisms by which emerging adults make friends online, it is important to consider individual differences in the type of loneliness as well as their motives for going online and their communication while online.

Keywords: Internet; loneliness; Internet friendship; online friendship; Social Networking Sites; online communication; self-disclosure; emerging adults

1.0 Introduction

Emerging adulthood, in general, and the transition from high school to university or college, in particular, are heightened times for loneliness (Baker, 2012; Özdemir & Tuncay, 2008). Transitions, such as to university, disrupt the earlier connections and security found in the family and home community and require the emerging adult to establish new friends and possibly romantic relationships (Asher & Weeks, 2014). In general, the formation of intimate relationships is a key developmental task for emerging adulthood (Arnett, 2000; Erikson, 1968). The Internet, particularly Social Network Sites (SNSs), provides emerging adults an important alternative environment in which to maintain existing relationships and to make new ones. SNSs are online friend-networking sites (Boyd & Ellison, 2008). Facebook is the most common, with over 1 billion daily active users (Facebook Newsroom, 2016). Emerging adults are the most prevalent SNS users; 89% of 18- to 29-year-olds have a SNS profile (Pew Research Centre, 2014). University students commonly use SNSs to make new friends and to connect with old ones (Pempek, Yermolayeva, & Calvert, 2009; Raake & Bonds-Raake, 2008). We tested a model of the social motives for Internet use and online communication behaviours that might explain the SNS friendships of lonely emerging adults in their first year of university.

Since its inception, there have been mixed findings regarding the relationship between Internet use and loneliness, and debate regarding the direction of any cause-effect relationship (Stepanikova, Nie, & He, 2010). As a result, there are many explanatory hypotheses. Early studies found that higher Internet use was associated with increased loneliness, which was explained by the time online displacing time that could be spent developing more gratifying face-to-face (F2F) relationships (displacement hypothesis; Kraut et al., 1998; Morahan-Martin & Schumacher, 2000). However, not all studies found this (Kraut et al., 2002; Gordon, Juang, & Syed, 2007). In contrast to the displacement

hypothesis, Valkenburg and Peter's (2007) stimulation hypothesis was that the Internet can stimulate social interaction. The current study derived from McKenna and Bargh's (2000) social compensation hypothesis, which proposes that the Internet attracts individuals who are lonely because it offers them broader social networks than are available offline and altered patterns of communication to overcome poor social skills (Morahan-Martin, 1999; Whitty, 2008). This social compensation hypothesis is a "poor-get-richer model", and contrasts with the social enhancement hypothesis or "rich-get-richer model", which argues that those who are already rich in interpersonal capital and social skills benefit more from online communication options (Zywica & Danowski, 2008).

Amichai-Hamburger and Schneider (2014) identified the characteristics of the online psychological environment that enable these altered communication patterns and differentiate it from the offline environment. These are anonymity, enhanced ability to control one's physical appearance and social interactions, enhanced ability to find similar others that one might not encounter in the offline world, the flexibility of access, and the capacity to interact asynchronously. Anonymity reduces social anxiety (McKenna, Green, & Gleason, 2002). In addition, the combined anonymity and asynchronicity of online communication promote social disinhibition, leading to greater self-disclosure, which is related to friendship formation and maintenance (Bonetti, Campbell, & Gilmore, 2010; Joinson, 2007). This particularly suits those who are lonely as they typically engage in less self-disclosure (Solano, Batten, & Parrish, 1982). Unlike some other communication options on the Internet (e.g., chat rooms, discussion forums), SNSs tend not to be anonymous as users create and maintain a personal and largely public profile (Boyd & Ellison, 2008). However, they do afford users the other important characteristics noted by Amichai-Hamburger and Schneider.

Amichai-Hamburger, Kaplan, and Dorpatcheon (2008) found support for the social compensation hypothesis of Internet or SNS use with introverted young people; that is, they

were motivated to use SNSs to compensate for their poorer social skills. However, although Poley and Luo (2012) found that socially incompetent young people perceived that online dating would be beneficial to them, they did not prefer online dating, yielding only partial support for the social compensation hypothesis. Understanding the motives that people have for Internet or SNS use is important as this influences the extent to which they communicate with others and seek out friendships or other relationships online (Rubin, 2002). For example, Peter, Valkenburg, and Schouten (2005) found that when introverted children and adolescents held stronger social compensation motives, they communicated with others more online, and this was related to making more new online friendships. Others also found that lonely adolescents and adults were more motivated than those who were not lonely to use the Internet (Morahan-Martin & Schumacher, 2003) and Facebook (Teppers, Luyckx, Klimstra, & Goosens, 2014) for social compensation and to meet people. Social compensation motives were associated with more time communicating online (Amichai-Hamburger & Ben-Artzi, 2003), which was related to making more new online relationships (Bonebrake, 2002) that were rated more satisfying and closer than F2F friendships (Baker & Oswald, 2010; Morahan-Martin & Schumacher, 2003).

We extended this existing literature by testing a model that examined social compensation and networking Internet use motives and, in turn, online communication behaviours as predictors of the number of SNS friends of lonely emerging adults in their first year of university (Figure 1). We included age and gender as potential control variables. Dunbar (2016) found that younger age was associated with more total SNS friends. The findings for gender differences are mixed, depending on whether the total number of SNS friends or the number of new friends made on SNSs is examined. Dunbar reported that females had more total SNS friends. However, others found that males were more likely to use SNSs to make new friends (Lenhart & Madden, 2007; Muscanell & Guadagno, 2012).

We examined three dimensions of offline loneliness (social, romantic, and familial) as predictors of these online motives and behaviours, thereby extending on existing studies that have examined loneliness as a unidimensional construct (e.g., Gordon et al., 2007) or only examined peer- and parent-related loneliness (Teppers et al., 2014). Social loneliness is the lack of an adequate supportive social network with which the individual can relate and gain a sense of belonging, whereas emotional loneliness is the subjective interpretation and response to the lack of a close emotional attachment figure (familial or romantic) that can provide personal support (Weiss, 1973). As these different forms of loneliness are associated with different psychopathology (Lasgaard, Goosens, Bramsen, Trillingsgaard, & Elklit, 2011), it is important to examine them separately (see also Cramer & Barry, 1999). Further, online motives and friendship outcomes differ depending on the type of loneliness. Teppers et al. (2014) found that only social loneliness was related to Facebook use motives; parent-related loneliness was not and they did not examine romantic loneliness. Moody (2001) found that emotional, but not social, loneliness was associated with more online friends.

We expected that higher loneliness, particularly, social loneliness, would be associated with stronger social compensation and networking motives, which would, in turn, be associated with more frequent online communication, and via that with more friends on SNSs (Peter et al., 2005; Teppers et al., 2014). We examined both the total number of SNS friends as well as the number of new friends that had been made exclusively online. Consistent with Valkenburg and Peter's (2009) Internet-enhanced self-disclosure hypothesis, in which online communication leads to greater self-disclosure and, in turn, friendships, we expected that online communication would be related to the amount of self-disclosure (Morahan-Martin & Schumacher, 2003; Peter et al., 2005), and, via that, to the number of friends (McKenna & Bargh, 2000; Peter et al., 2005).

2.0 Method

2.1 Participants

Participants were 149 first-year psychology students aged 17 to 25 years with an active SNS profile (i.e., a current profile with at least 1 friend). There were 120 women and 28 men (M_{age} = 20.31 years; *SD* = 2.51). Most were domestic students (89.2%) and identified culturally as Australian (80.1%), reflecting the population at the participating university.

Participants reported living with their parents (49.0%), housemates or friends (33.8%), romantic partners (14.5%), relatives (1.4%), or their children (1.4%). Participants' SES was measured using Hollingshead's 4-Factor Index of Social Status (Hollingshead, 1975, as cited in Bornstein & Bradley, 2003). A wide range of SES was represented, with the average indicating middle SES (*M* = 40.08; *SD* = 11.33; range = 11 – 61).

2.2 Materials

Unless otherwise indicated, scale item responses were made on a 7-point Likert-type response format, ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*). Scale items were summed, with higher scores indicating stronger endorsement of that construct.

2.2.1 Loneliness. The Social and Emotional Loneliness Scale (DiTommaso & Spinner, 1993) comprises 37 items. The social loneliness subscale measures satisfaction with social friendships (14 items; e.g., "I do not feel satisfied with the friends that I have"). There are two emotional loneliness subscales: romantic loneliness, which measures involvement in a satisfying intimate relationship (12 items; e.g., "I find myself wishing for someone with whom to share my life"), and family loneliness, which assesses close and fulfilling family relationships (11 items; e.g., "No one in my family really cares about me"). DiTommaso and Spinner (1993) reported high internal consistency (Cronbach's αs = .89 - .93) and support for validity based on factor analysis and expected associations with other loneliness scales. Based on their comparison of the psychometric properties of seven measures of loneliness, Cramer and Barry (1999) recommended the SELSA over six other well-known loneliness

scales based on its factorial validity and high internal consistency. The current Cronbach's αs were .92 to .93.

2.2.2 Internet Use Motives. We derived 12 items from existing measures (Peter et al., 2005; Wolfradt & Doll, 2001). A principal components analysis with oblique rotation extracted two components based on 10 items, which accounted for 57% of the variance (Table 1). One of the original items was removed because it did not load on either component, and the other because it loaded significantly on both. The components were labeled social networking (5 items; $\alpha = .80$) and social compensation (5 items; $\alpha = .76$) motives. They were correlated .45, suggesting overlapping but distinguishable motives. In support of validity, both motives were positively associated with the amount of online communication (Table 3).

2.2.3 Online communication. Participants reported the total number of hours per week that they communicated on SNSs, chatted online, instant messaged, or participated in discussion/news groups.

2.2.4 On-line friendships. Participants reported the total number of friends attached to their SNSs (*total online friends*) and the number of new friends they had made solely online (*new online friends*).

2.2.5 Self-disclosure. Four items from Peter et al. (2005) assessed the likelihood of discussing romantic love, secrets, falling in love, and dating with someone they interacted with most online. Responses were on a 1 (*Very unlikely*) to 7 (*Very likely*) scale. Cronbach's α was .94.

2.3 Procedure

Ethical clearance was obtained from the authors' university ethics committee. Participants were recruited from a 1st-year psychology course in which research participation was required. The anonymous paper-and-pen questionnaire took approximately 20 minutes to complete. Participants received course credit for their participation.

3. 0 Results

Facebook was the most commonly used SNS (76.5%), but 44.3% reported using two, 10.7% three, and 2.7% four or more different SNSs. Facebook-only SNS users did not differ from multiple SNS users on loneliness, interpersonal communication motives, online communication, self-disclosure, or the numbers of new friends made online, but reported significantly more total online friends (M = 136 cf. 103; p = .004). Similarly, the number of SNSs used was not related to loneliness, motives, self-disclosure, or either measure of friends, but was weakly positively related to the amount of online communication (r = .22, p = .006). Most commonly, participants checked their SNSs daily (28.2%) or 2 to 5 times per week (31.5%). On average, they spent 5.61 hours per week (SD = 7.28; range 0-50) on SNSs, 4.89 hours per week (SD = 7.56; range 0-40) chatting/instant messaging, and 1.48 hours per week (SD = 2.75, range 0-24) participating in discussion/news groups.

The descriptive statistics and bivariate correlations are in Tables 2 and 3, respectively. The social compensation motive was correlated with all three forms of loneliness. However, only romantic loneliness was significantly correlated with the social networking motive (i.e., using the Internet to meet new friends). Both motives were positively correlated with online communication and self-disclosure, and, as expected, with making new friends online. However, neither was directly correlated with the total number of online friends. Online communication and self-disclosure were positively correlated with each other and with the total number of online friends. Only online communication was related to number of new online friendships.

There was a significant gender difference in the number of new online friends, with men reporting more new friends online (M = 14.36) than women (M = 7.16), t (146) = 2.03, p = .044, but not in total online friends (Ms = 178.25 and 171.85, respectively; p = .82). Thus, we controlled gender when predicting new online friends. Younger age was associated with

stronger social networking motives and more online communication, but not with either friendship outcome (Table 3). Therefore, age was not controlled.

Path analysis (structural equation modeling using observed variables; Loehlin, 1998) was conducted via AMOS 20 to test the hypothesized model (Figure 1). Between 0.8% and 4.2% of the data were missing completely at random, Little's MCAR Test: $\chi^2(906, N = 149) = 949.92$, $p = .15$. This was replaced using the maximum likelihood data imputation method in AMOS 20. There was positive skew in the distributions of social and family loneliness, online communication, and total and new online friends (critical ratios = 5.45, 8.78, 5.28, 10.09, and 16.11, respectively). We followed Blunch's (2008) recommended Bollen-Stine bootstrapping solution for analyzing non-normal data, using 1000 randomly drawn samples. This adjusts the chi-square and standard error of path estimates to adjust for the potential inflation in the maximum likelihood chi-square when there is a non-normal distribution.

Model fit was assessed using the Bollen-Stine bootstrapped χ^2; Comparative Fit Index (CFI), which compares the specified model to a model with complete independence; and the Root Mean Square Error of Approximation (RMSEA), which estimates the error due to the approximate fit of the model. With a sample of 149 and fewer than 12 variables, a non-significant χ^2, CFI values $\geq .97$, and RMSEA values $< .08$ reflect a good fit (Hair et al., 2010).

3.1 Prediction of Total Online Friends

The hypothesized model did not fit satisfactorily, $\chi^2(12, N = 149) = 107.33$, $p < .001$ (Bollen-Stine $p = .001$), CFI = .55, RMSEA = .23. Family loneliness was not related to any other variables, so was removed, as were non-significant paths from social loneliness to social networking and self-disclosure, from romantic loneliness to self-disclosure, and from social compensation to online communication. Modification indices were used to add new paths that had not been hypothesized, but which made theoretical sense: social networking

motives to social compensation motives and social compensation motives to the total number of online friends. The final model (Figure 2) showed good fit, $\chi^2(10, N = 149) = 11.54$, $p = .317$ (Bollen-Stine $p = .41$), CFI = .99, RMSEA = .03.

Romantic loneliness was significantly related to both motives, explaining 8% of the variance in the social networking motive to use the Internet to meet new people and 3% of the variance in the social compensation motive to use the Internet to compensate for poor social skills. Social loneliness was only related to social compensation motives, accounting for 14% of the variance in that motive. Social networking motives also directly accounted for 15% of the variance in social compensation motives.

Social loneliness had a weak direct negative relationship with self-disclosure (4% of the variance), but also an indirect positive relationship via social compensation. Thus, higher social loneliness was directly related to less self-disclosure, but when mediated by social compensation motives, was associated with greater self-disclosure. Social networking motives directly explained 23% of the variance in online communication. Social compensation, online communication, and self-disclosure were each directly related to total online friends, explaining 6%, 9%, and 5% of the variance in this outcome, respectively. There was a direct negative relationship between social compensation motives and total online friends; that is, those who were using the Internet to compensate for poor social skills reported fewer online friends. However, there was a positive indirect relationship via self-disclosure; that is, when those motivated by poor social skills engaged in more self-disclosure, they reported having more online friends. Thus, lonely individuals accumulated more friends on their SNSs via Internet use motives that were related to more self-disclosure and more time communicating online. Overall, 18% of the variance in the total number of online friends was explained in this model.

3. 2 Prediction of New Online Friends

The hypothesized model did not show satisfactory fit, $\chi^2(19, N = 148) = 115.96$, $p < .001$ (Bollen-Stine $p = .001$), CFI = .55, RMSEA = .19. The path from gender to new online friends was no longer significant when other variables were included, so this path was removed. Family loneliness was also not significantly related to any other variables. Other non-significant paths from social loneliness to social networking motives, romantic loneliness to self-disclosure, social compensation motives to online communication, social networking motives to self-disclosure, and self-disclosure to the number of new friends were also removed. Based on modification indices, and for theoretical reasons, paths from social networking to social compensation and to number of new friends were added. The final model (Figure 3) showed good fit, $\chi^2(11, N = 149) = 22.16$, $p = .18$ (Bollen-Stine $p = .303$), CFI = .97, RMSEA = .05.

The final model was very similar to that predicting total online friends. However, self-disclosure was not related to making new friends online. Therefore, social loneliness was not related, either directly or indirectly, to making new friends online. Social networking motives and the amount of online communication were directly related to the number of new friends (explaining 8% and 4% of the variance, respectively). Romantic loneliness was indirectly related to the number of new online friends via stronger social networking motives and greater online communication. Overall, 17% of the variance in new online friends was explained.

4.0 Discussion

These results explicate a model by which loneliness in emerging adults is related to online friendships, specifically on SNSs such as Facebook. Loneliness was not directly related to either the number of new friendships formed exclusively online or the total number of friends attached to SNSs. However, it was indirectly related to these friendship outcomes via individual differences in Internet use motives and the extent of online communication and

self-disclosure. Further, there were different relationships depending on the specific type of loneliness, as well as whether new or total online friendships were examined. Family loneliness was not related to either social compensation or social networking motives nor to either friendship outcome in the models tested, despite showing a bivariate relationship with social compensation motives. Teppers et al. (2014) also failed to find relationships between familial loneliness and Facebook use motives, suggesting this dimension of emotional loneliness is not an important factor in why young people use the Internet to make or maintain friends.

Social loneliness was significantly related to social compensation motives. Thus, loneliness associated with a perceived lack of friends was associated with stronger motives to use the Internet to compensate for F2F communication difficulties. This is consistent with Teppers et al. (2014), but contrary to their findings, social loneliness was not associated with social networking motives to meet new people. There were some interesting mediated relationships between social loneliness and self-disclosure via social compensation. Higher social loneliness was directly related to lower self-disclosure; however, when mediated by social compensation motives, it was related to higher self-disclosure. Peter et al. (2005) also found contrasting direct negative and indirect positive relationships between introversion and self-disclosure in their adolescent sample. However, unlike Peter et al., we did not find that either social compensation motives or self-disclosure were related to making new friends online. Consequently, social loneliness was not related to making new friends online.

However, social loneliness was indirectly related to having more total SNS friends via stronger social compensation motives and more online self-disclosure. There were contrasting direct and indirect relationships; social compensation motives were directly related to having fewer SNS friends, but indirectly related to having more friends via engaging in more self-disclosure. Thus, the amount of self-disclosure engaged in was the

important factor in the total number of SNS friends. As most of the friends on the SNSs were not made online (i.e., were drawn from offline networks), this is consistent with previous findings that greater online self-disclosure occurs with existing friends (Valkenburg & Peter, 2007).

Romantic loneliness was also related to total SNS friends via social compensation motives and, in turn, greater self-disclosure. This is not consistent with Poley and Luo (2012) who failed to find support for social compensation motives regarding dating online. However, SNSs are not dating sites, but general friendship sites. This suggests that motives differ depending on the specific social sites being accessed online. However, we found that romantic loneliness was indirectly related to both new and total SNS friends via social networking motives and, in turn, online communication. Social networking motives referred to the use of the Internet to meet and interact with new people. Our results suggest that romantically lonely emerging adults who are motivated to meet new people spend more time communicating with others online, and, through that, have more friends on their SNSs and make more new friends online. The fact that only romantic loneliness was indirectly related to both these friendship outcomes is consistent with Moody's (2001) finding that only emotional not social loneliness is associated with the online network of friends.

While having online friends might alleviate offline loneliness (e.g., Teppers et al., 2014), there does appear to be an upper limit to the number of friends that an individual can optimally manage. More is not necessarily better. Dunbar argued that 150 was the optimal network size that humans can cognitively accommodate. Our sample mean of 172 total friends was similar to that found by Dunbar (2016). The modal number of SNS friends in his adult samples ranged from 155 to 186, which did not differ significantly from 150. Like our sample, Dunbar found a long tail of participants who reported higher numbers of friends. Another consideration when examining online "friends" is that the definition of "friend" is

likely to be broader than that used in other contexts (Tong, van der Heide, Langwell, & Walther, 2008). We did not specify any definition, simply asking how many friends were attached to or made on their SNS. This might have encompassed a broader range and quality of relationships and many of these might constitute weak ties (Ellison, Steinfield, & Lampe, 2007). Dunbar found that only 27% of SNS friends were considered genuine or close friends. Further, on average only 4 people on their SNSs were considered likely to provide support in a crisis. However, it is likely that for lonely emerging adults who are experiencing transitions to university, even weak online ties can provide opportunities for interpersonal communication that is lacking in F2F contexts.

There are some cautions with our results. Our sample was small and limited to first-year university students, so needs to be replicated with a broader sample of emerging adults, as well as younger and older cohorts. Future research also needs to examine whether these results hold for online communication options other than SNSs. Valkenburg and Peter (2009) argued that the type of Internet communication channel matters. For example, despite providing more anonymity, chatrooms largely involve communication with strangers and have been associated with negative effects on social connectedness, and, thus, on well-being.

Another caution is that we had more young women than men in the sample. We found weak gender effects only for the number of new friends made online. Consistent with previous studies, males reported making more new friends (Lenart & Madden, 2007; Muscanell & Guadagno, 2012). However, this became non-significant in the context of the full model. Contrary to Dunbar (2016), we found no gender differences in the total number of friends. However, as we had many more females than males in the current sample, these results require replication with a more representative sample.

Future research is also needed to examine whether our results hold if social anxiety is controlled. Caplan (2007) showed that the relationship between loneliness and preference for

online interaction was completely explained by social anxiety. Certainly, our results indicated that social and romantic loneliness were related to online communication via motives to compensate for social difficulties including social anxiety. Future research needs to include a measure of social anxiety to examine if loneliness retains any unique relationships with these motives and online behaviours.

We examined loneliness and online friendship formation largely from the perspective of the social compensation hypothesis (McKenna & Bargh, 2000). However, the results are also consistent with a social reconnection hypothesis (Baumeister, Brewer, Tice, & Twenge, 2007). According to this hypothesis, social exclusion, such as that felt by those who are lonely, motivates people to seek social connections via alternative means. Our results show that, when interpersonally motivated, SNSs provide an alternative means for reconnecting with others. In addition, our results are also partially consistent with elements of Valkenburg and Peter's (2009) Internet-enhanced self-disclosure hypothesis, although the online communication → self-disclosure → friendships relationship only held for total SNS friends; that is, for SNS networks that largely consisted of existing offline connections. However, in contrast to Valkenburg and Peter's findings regarding adolescents and instant messaging (which involves existing friendship networks), we found that self-disclosure did not completely mediate the online communication → friendship relationship for lonely emerging adults using SNSs. This highlights the fact that the type of Internet channel used, and potentially other factors like age, are important to consider in this research.

Our results paint quite a complex picture of the relationship between loneliness and online friendships in emerging adult university students. Both social and romantic loneliness were indirectly related to the total number of friends the individual had on their SNSs, but the mechanisms underlying this differed in terms of the driving motives and the amount of online communication and self-disclosure. Only romantic loneliness was indirectly related to

making new friends online, and that was via specific motives to meet new people as well as by spending more time communicating online. There is now enough evidence to show that future research into online friendship formation must consider individual differences in the type of loneliness experienced, the motives for Internet use, and the specific online communication behaviours, as well as the Internet communication technology used. Our results also suggest potential targets for interventions designed to optimize online friendship formation by young adults who are lonely.

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Table 1

Principal Components Analysis of Internet Use Motives

Item	Loadings	
	Social Networking	Social Compensation
One of the reasons I use the Internet is to meet and interact with new, exciting people	**.84**	.13
I have found new friends and acquaintances through the Internet	**.80**	.11
One of the reasons I use the Internet is to meet and interact with others who share interests that are similar to mine	**.72**	.17
One of the reasons I use the Internet is to chat with other individuals on-line	**.68**	-.31
The Internet is to me a substitute for other social contacts	**.50**	.26
I feel more confident interacting with people online than F2F	.10	**.72**
I am inclined to keep in the background on social occasions	-.29	**.71**
I feel less shy when I interact with people online	.09	**.69**
I use the Internet to make friends because I find this easier than making friends off-line	.31	**.68**
One of the reasons I use the Internet is to look for others with whom I can develop a romantic relationship	.31	**.58**
Eigenvalues	4.10	1.59
Percentage of variance extracted	40.98	15.94
Kaiser-Meyer-Olkin measure of sampling adequacy	0.80	
Bartlett's test of sphericity	$\chi^2(45) = 584.25$, $p < .001$	

Note. .45 was the minimum factor loading required for significance at an alpha level of .05 (Hair, Black, Babin, Anderson, & Tatham, 2010).

Table 2

Descriptive Statistics for Loneliness, Motives, Online Communication, Self-disclosure, and Total and New Online Friends

Variable	*M* ($CI_{0.95}$)	Range	Maximum Possible Score
Romantic loneliness	40.48 (37.39 – 43.58)	12 – 80	84
Family loneliness	20.20 (18.48 – 21.93)	11 – 65	77
Social loneliness	32.09 (30.12 - 34.05)	14 – 76	98
Social networking motive	19.52 (18.45 – 20.59)	6 – 35	35
Social compensation motive	13.71 (12.80 – 14.62)	5 – 33	35
Online communication (hrs/wk)	10.63 (8.66 – 12.61)	0 – 60	
Self-disclosure	17.75 (16.53 – 18.98)	4 – 28	28
New online friends	8.48 (5.72 – 11.23)	0 – 100	
Total online friends	172.64 (151.35 – 193.94)	5 – > 600	

Table 3

Correlations among Loneliness, Motives, Online Communication, Self-Disclosure, Age, and Online Friends

	Variable	1	2	3	4	5	6	7	8	9	10
1.	Romantic loneliness	-									
2.	Family loneliness	.16	-								
3.	Social loneliness	.14	.57***	-							
4.	Social networking	.29***	-.03	.05	-	.					
5.	Social compensation	.33***	.23**	.42***	.45***	-					
6.	Online communication	.21*	.09	.09	.48***	.20**	-				
7.	Self-disclosure	-.06	-.09	-.09	.22**	.18*	.20*	-			
8.	Age	-.14	-.05	.06	-.17*	-.05	-.19*	.07	-		
9.	New online friends	.10	.05	.16*	.38***	.28**	.33***	.09	-.05	-	
10.	Total online friends	-.00	-.05	-.09	.14	-.14	.29**	.24**	-.06	.38***	-

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

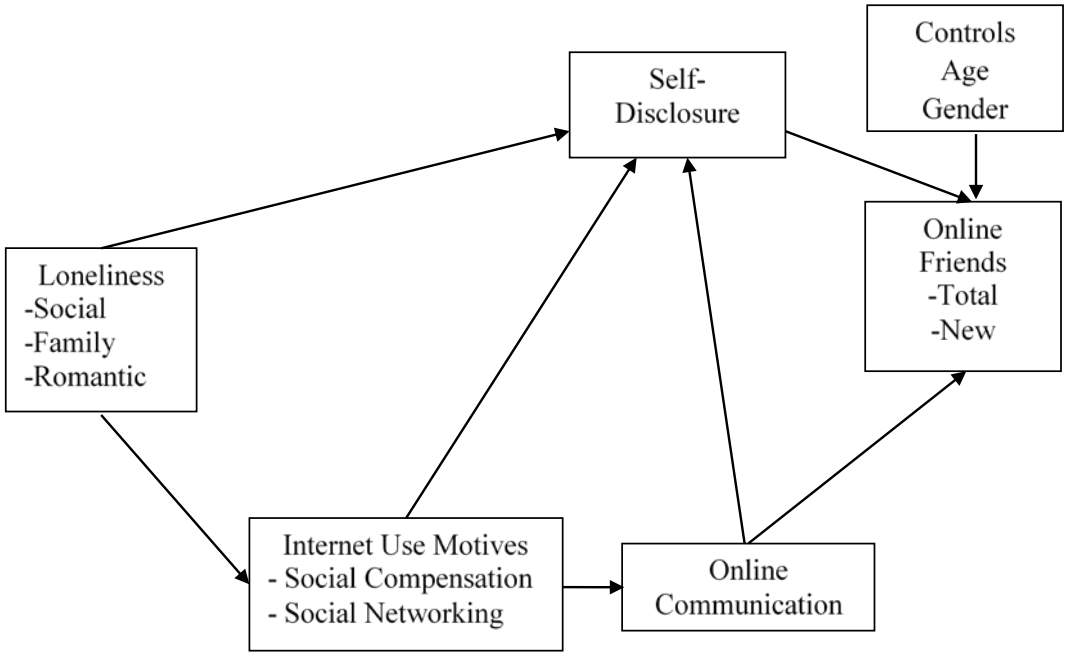

Figure 1. Hypothesised model of the relationship between loneliness and friends on SNSs.

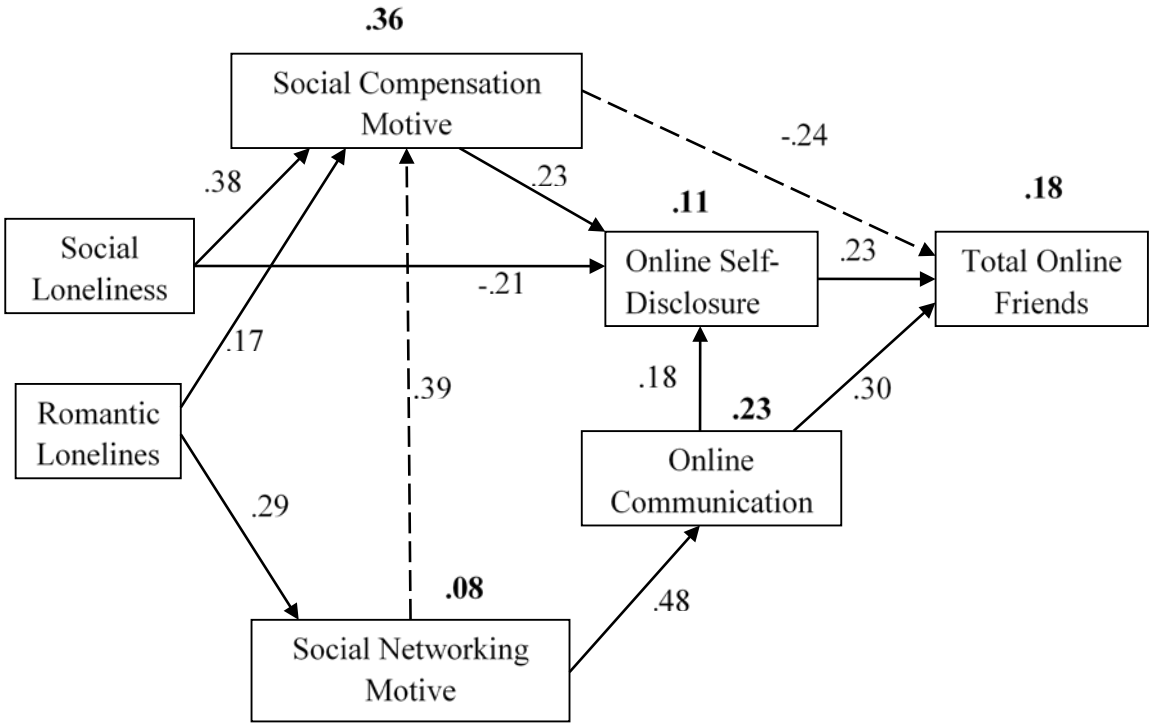

Figure 2. Observed model showing standardised β weights predicting total number of friends on SNSs. Solid paths were initially hypothesised and supported. Dashed lines indicate meaningful paths added to the model. Nonsignificant paths are omittted for ease of reading. Squared multiple correlation coefficients are shown in bold.

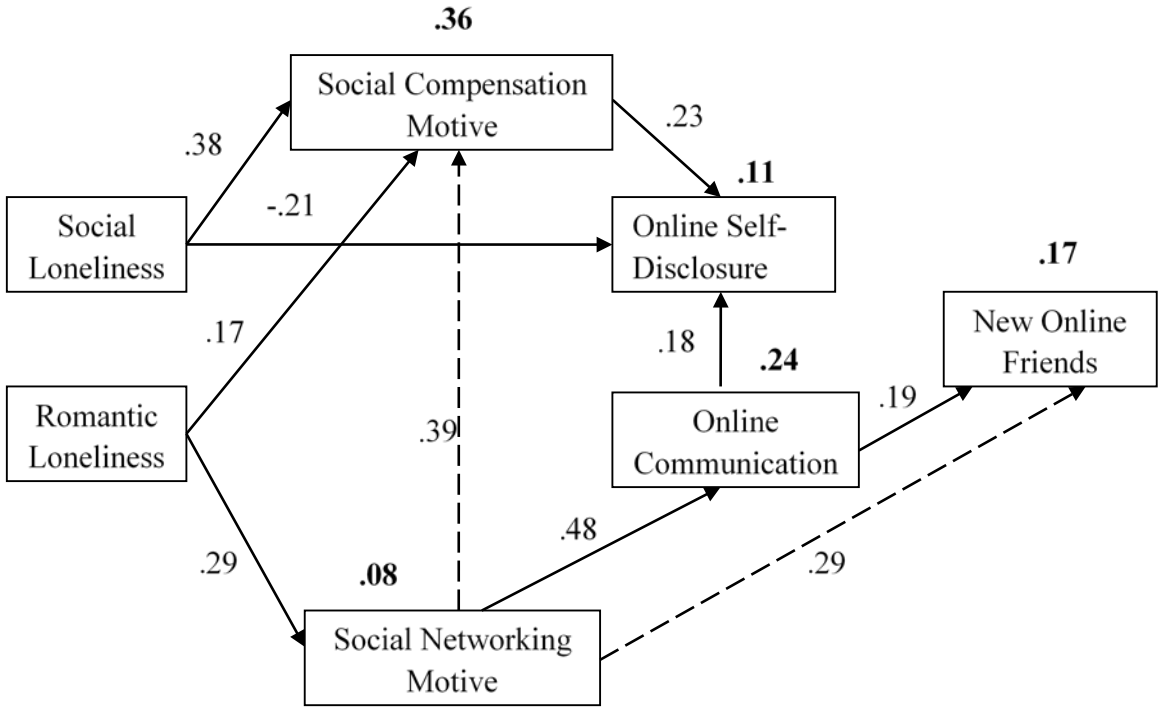

Figure 3. Observed model showing standardised β weights predicting formation of new friends online. Solid paths were initially hypothesised and supported. Dashed lines indicate meaningful paths added to the model. Nonsignificant paths are omittted for ease of reading. Squared multiple correlation coefficients are shown in bold.