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# Who uses Facebook? An investigation into the relationship between the Big Five, shyness, narcissism, loneliness, and Facebook usage

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ABSTRACT

The unprecedented popularity of the social networking site Facebook raises a number of important questions regarding the impact it has on sociality. However, as Facebook is a very recent social phenomenon, there is a distinct lack of psychological theory relating to its use. While research has begun to identify the types of people who use Facebook, this line of investigation has been limited to student populations. The current study aimed to investigate how personality influences usage or non-usage of Facebook. The sample consisted of 1324 self-selected Australian Internet users (1158 Facebook users and 166 Facebook nonusers), between the ages of 18 and 44. Participants were required to complete an online questionnaire package comprising the Big Five Inventory (BFI), the Narcissistic Personality Inventory – 29-item version (NPI-29), the Revised Cheek and Buss Shyness Scale (RCBS), and the Social and Emotional Loneliness Scale for Adults – Short version (SELSA-S). Facebook users also completed a Facebook usage questionnaire. The results showed that Facebook users tend to be more extraverted and narcissistic, but less conscientious and socially lonely, than nonusers. Furthermore, frequency of Facebook use and preferences for specific features were also shown to vary as a result of certain characteristics, such as neuroticism, loneliness, shyness and narcissism. It is hoped that research in this area continues, and leads to the development of theory regarding the implications and gratifications of Facebook use.



## 1. Introduction

The popularity of the social networking site Facebook is unprecedented: It is currently the second most frequently visited website on the Internet (Alexa Internet Inc., 2011) and attracts a global audience of over 606 million people (Gonzalez, 2011). Enthusiasm for Facebook is particularly apparent in Australia, as close to half of the population are reported to be active users (Gonzalez, 2011). In light of figures such as these, it is not surprising that Facebook has been found to impact on the sociality of its users. For instance, a number of studies have found that Facebook use is associated with gains in social capital (Burke, Marlow, & Lento, 2010; Ellison, Steinfield, & Lampe, 2007; Steinfield, Ellison, & Lampe, 2008). Furthermore, a recent qualitative study suggests that Facebook may be changing the way individuals communicate and associate with one another (Richardson & Hessey, 2009).

Despite the potential implications of Facebook use, there is a distinct lack of empirically derived theory in this area. This may be because Facebook is a relatively recent social phenomenon, and as such, there has been limited opportunity for exploratory research. However, in the last two years, a growing number of researchers have recognised the importance of such research, and are working towards identifying the types of people who use Facebook (Hargittai, 2008; Raacke & Bonds-Raacke, 2008; Sheldon, 2009; Tufekci, 2008). In order to effectively achieve this goal, some researchers have focused on the relationship between Facebook use and various aspects of personality (Amichai-Hamburger, 2002; Buffardi & Campbell, 2008; Mehdizadeh, 2010; Orr et al., 2009; Ross et al., 2009; Sheldon, 2008). According to Amichai-Hamburger (2002), this kind of research is crucial as "personality is a highly relevant factor in determining behaviour on the Internet" (p. 6).

### 1.1. Personality and the Internet

In 1974, Rosengren (1974) argued that individual differences, such as age, gender, and personality, influence the use of mass media. This theory has been successfully applied in research relating to preferences for popular media, such as movies, music, and television shows (Weaver, 1991), as well as books and cultural activities (Kraaykamp & van Eijck, 2005). However, since the rise of the World Wide Web as a prominent form of mass media, the Internet has seemingly dominated this area of scientific enquiry (Amichai-Hamburger, Wainapel, & Fox, 2002; Amiel & Sargent, 2004; Birnie & Horvath, 2002; Engelberg & Sjöberg, 2004;

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Hamburger & Ben-Artzi, 2000; Thayer & Ray, 2006; Tosun & Lajunen, 2010).

Rather than looking at the relationship between Internet use and specific traits, the majority of research in this area has been based on broad models of personality. The Five-Factor Model, otherwise known as the Big Five (Goldberg, 1990), is arguably the most commonly used model for this purpose (Ehrenberg, Juckes, White, & Walsh, 2008; Landers & Lounsbury, 2006; Swickert, Hittner, Harris, & Herring, 2002; Tuten & Bosnjak, 2001). The Big Five is based on the theory that an individual's personality can be evaluated by determining how they rank on five bipolar factors: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience (McCrae & John, 1992). Within each of these five broad factors, a range of more specific personality traits are represented. For example, individuals high in openness to experience tend to be creative, original, and curious, while individuals low in this factor tend to be down to earth, conventional, and have a narrow range of interests (Costa & McCrae, 1992). The importance of each of the Big Five personality factors has been independently validated by a number of researchers, and empirical testing across various methods and cultures has shown this model to be widely replicable (for a detailed review see McCrae and John, 1992).

Several of the Big Five personality factors are believed to be associated with the way individuals interact with and maintain their social relationships. For example, extraversion is positively correlated with both the size of social networks, and the amount of social interaction that an individual engages in Aspendorpf and Wilpers (1998). Due to its relevance to social behaviour, the Big Five factors have recently been employed to investigate the use of certain forms of online social media, such as social networking sites (Amichai-Hamburger & Vinitzky, 2010; Correa, Hinsley, & de Zúñiga, 2010; Ross et al., 2009) and blogs (Guadagno, Okdie, & Eno, 2008).

### 1.2. The Big Five and Facebook

Ross et al. (2009) and Amichai-Hamburger and Vinitzky (2010) looked specifically at the relationship between the Big Five factors and usage of Facebook. Their results showed that a number of these factors are associated with particular patterns of Facebook use. For example, extraverted individuals generally have more Facebook Friends (Amichai-Hamburger & Vinitzky, 2010), and belong to more Facebook Groups[1] (Ross et al., 2009), than introverted individuals. Furthermore, individuals who are high in neuroticism are more likely than emotionally stable individuals to prefer using the Wall[2] (Ross et al., 2009). As Ross et al. (2009) explain, a possible reason for the latter result is that the Wall offers people with neurotic tendencies the opportunity to take their time formulating messages and responses. As a consequence, the potential for unintentionally revealing personal information to others is reduced.

Despite the prediction that extraverted people would engage in more frequent use of Facebook, while conscientious people would engage in less, neither Ross et al. (2009) nor Amichai-Hamburger and Vinitzky (2010) found any significant relationships between the Big Five factors and intensity of Facebook use. In response to this, Ross et al. (2009) argued that, as a measure of personality, the Big Five might be too broad to reflect the nuances associated with Facebook usage. They suggested that future Facebook-related research should include a number of narrow personality traits, such as shyness and narcissism. Some researchers have begun to examine the relationships between these traits and Facebook use: Buffardi and Campbell (2008) and Mehdizadeh (2010) investigated Facebook use among narcissistic individuals, while Sheldon (2008) and Orr et al. (2009) focused on the association between Facebook use and shyness.

### 1.3. Shyness, narcissism, and Facebook

The results of the studies by Buffardi & Campbell (2008) and Mehdizadeh (2010) indicate that people with high levels of narcissism engage in frequent use of Facebook. According to those researchers, this trend is attributable to the fact that Facebook encourages users to engage in self-promoting and superficial behaviours, such as posting photos and writing status updates (Buffardi & Campbell, 2008; Mehdizadeh, 2010). As Buffardi and Campbell (2008) point out, the prevalence of narcissistic individuals on Facebook may lead to a rise in narcissistic behaviour among users in general, as such behaviour may begin to be viewed as acceptable. Therefore, this is an area worthy of further investigation.

In regards to shyness, the results of the study by Orr et al. (2009) demonstrated that shy people spend significantly more time using Facebook than non-shy people. Similarly, Sheldon (2008) found that people who are socially anxious like to use Facebook to combat loneliness. These outcomes may stem from the fact that shy and socially anxious people tend to feel more comfortable maintaining social relationships in online settings than they do in face-to-face interactions (Ebeling-Witte, Frank, & Lester, 2007). If this is the case, Facebook use may lead to beneficial outcomes for these particular people, such as increased social capital (Steinfield et al., 2008). However, as neither Sheldon (2008) nor Orr et al. (2009) examined exactly how shy and socially anxious people were spending their time on Facebook, this conclusion may be erroneous. Shy people may instead be spending large amounts of their time engaging in non-social behaviour on Facebook, such as playing games. Again, this is an area that warrants further investigation.

### 1.4. Rationale for the current study

The research discussed so far suggests that the specific gratifications of Facebook users may differ as a function of their individual personality characteristics. Such findings represent an important first step for the foundation of Facebook-related theory. However, as the results of these studies have been based on data derived exclusively from university students, generalisability to the typical Facebook user is limited. It is therefore essential that these studies are replicated in wider populations, preferably in samples recruited from the Internet. Furthermore, in order to obtain a more accurate representation of the types of people that Facebook appeals to, it is recommended that researchers compare the personality characteristics of Facebook users with those of nonusers. In response to these issues, the current study was designed to investigate the relationship between personality and Facebook usage in a large population of Australian Internet users. In keeping with previous research, this study focused on the narrow traits of shyness and narcissism, as well as the Big Five personality factors. In addition, the emotional state of loneliness was included, as engaging in social behaviour on the Internet has previously been found to reduce levels of loneliness (Shaw & Gant, 2002).

### 1.5. Aims and hypotheses

The specific aims of the current study were twofold: to explore the possibility that people with certain characteristics were more likely to be Facebook users, and to ascertain whether these characteristics were related to differential usage of the site. It was hypothesised that individuals with higher scores on extraversion

[1] Facebook Groups are generally based around popular interests and activities. Users can join existing Groups or create their own.

[2] Each Facebook user has a Wall that their friends can use to write messages or post links for the user to see. Communication on the Wall is asynchronous, and the posted information is generally viewable to other Facebook users.

and narcissism would be more likely to be Facebook users, while individuals with greater levels of conscientiousness and loneliness would tend to be Facebook nonusers. In regards to Facebook usage habits, it was expected that shy and lonely people would spend more time using Facebook per day, while conscientious people would spend less. It was further predicted that high levels of extraversion would be associated with increased preference for the communicative features of Facebook, such as Chat.[3] Additionally, people with higher levels of neuroticism were expected to prefer the asynchronous methods of communication on Facebook, such as the Wall. Finally, individuals with narcissitic tendencies were predicted to enjoy using Facebook features that could be used for self-promotion, such as Status Updates[4] and Photos.[5]

## 2. Method

### 2.1. Participants

A total of 1635 self-selected Australian Internet users participated in the study. In order to obtain a sample that was representative of average Australian Facebook users (Gonzalez, 2011), participants were required to be between 18 and 44 years old. Data from participants who failed to complete the online questionnaire ($n = 311$) were removed from the study. Of the 1324 remaining participants, 166 were Facebook nonusers (96 men and 70 women, $M_{\text{age group}} = 25–34$), and 1158 were Facebook users (460 men and 698 women, $M_{\text{age group}} = 25–34$).

### 2.2. Materials

Participants were required to complete an online questionnaire package consisting of 124 questions. The questionnaire comprised:

1. A plain language explanatory statement (PLS). The PLS was designed to inform the participant about the aims of the study, as well as the risks and benefits associated with participation.
2. A set of five non-identifying demographic questions relating to age, gender, Australian residency, type of Internet connection, and daily Internet usage.
3. The Big Five Inventory (BFI; John, Donahue, & Kentle, 1991). The BFI is a 44-item measure that yields a score for each of the Big Five personality factors: extraversion (eight items), agreeableness (nine items), conscientiousness (nine items), neuroticism (eight items), and openness to experience (10 items). Each item consists of a short statement, and respondents are required to rate the degree to which they agree with each statement on a 5-point Likert scale (1 = "Strongly disagree" to 5 = "Strongly agree"). The BFI was deemed to be a good choice for the current study, as it can be completed in less than 5 min, and it has strong psychometric properties. For instance, the BFI is known to have clear factor structure, and each subscale has been shown to have satisfactory reliability and validity among Internet respondents (Srivastava, John, Gosling, & Potter, 2003). The test–retest reliability coefficients for each of the five subscales are good, and range between .76 and .83 (Gosling, Rentfrow, & Swann, 2003). The internal consistency coefficients for each of the subscales are also good: extraversion ($\alpha = .86$), agreeableness ($\alpha = .79$), conscientiousness ($\alpha = .82$), neuroticism ($\alpha = .84$), and openness to experience ($\alpha = .80$) (Srivastava et al., 2003).
4. The Narcissistic Personality Inventory – 29-item version (NPI–29; Kansi, 2003). The NPI-29 is a forced-choice dichotomous measure of narcissistic tendencies. It provides a total narcissism score, as well as scores for four sub-factors: leadership/power (eight items), exhibitionism/self-admiration (seven items), superiority/arrogance (six items), and uniqueness/entitlement (eight items) (for more detail on the sub-factors of the NPI-29 refer to Svindseth et al., 2009). The NPI-29 was chosen for the current study as it has norms derived from a general population (Kansi, 2003; Svindseth et al., 2009), whereas other versions of the NPI do not. Test–retest correlations for the NPI-29 are satisfactory at .93 for total narcissism, .89 for leadership, .80 for exhibitionism, .64 for superiority, and .74 for uniqueness. Internal consistencies are adequate for the sub-factors of leadership ($\alpha = .70$) and exhibitionism ($\alpha = .64$), however the coefficients for superiority ($\alpha = .52$) and uniqueness ($\alpha = .51$) appear to be below the acceptable level (Svindseth et al., 2009). As a result of their poor internal consistency, the sub-factors of superiority and uniqueness were not included in the data analyses.
5. The Revised Cheek and Buss Shyness Scale (RCBS; Cheek, 1983). The RCBS is a 13-item measure of shyness that uses a 5-point Likert scale to measure the extent to which the respondent feels that each item is characteristic of them (1 = "Very uncharacteristic" to 5 = "Very characteristic"). The RCBS was selected as it is one of the most widely used measures of shyness, and it can be completed in a short amount of time. It also has sound psychometric properties: An evaluation of the RCBS found it to have strong internal consistency ($\alpha = .86$) and test–retest reliability ($r = .88$), as well as good convergent and discriminant validity (Hopko, Stowell, Jones, Armento, & Cheek, 2005).
6. The Social and Emotional Loneliness Scale for Adults – Short version (SELSA-S; DiTommaso, Brannen, & Best, 2004). The SELSA-S consists of 15 items, and produces a total loneliness score as well as scores for three sub-factors of loneliness; family (five items), romantic (five items) and social (five items). Users rate their level of agreement with each item using a 7-point Likert scale (1 = "Strongly disagree" to 7 = "Strongly agree"). The psychometric properties of the SELSA-S are good: Concurrent and discriminant validity has been established, while internal consistency for the subscales ranges from .87 to .90 (DiTommaso et al., 2004). An independent evaluation of seven popular measures of loneliness recommended the SELSA-S based on its high internal consistency (Cramer & Barry, 1999). This recommendation influenced the researchers' decision to include it within the current study.
7. A Facebook usage questionnaire. This questionnaire consisted of 18 questions relating to Facebook usage, such as "On average, how much time per day do you spend on Facebook?", and was adapted from the Facebook Questionnaire, which has been successfully used by Ross et al. (2009). Data from this questionnaire were used to see if there was an association between the measured personality characteristics and frequency of Facebook use, as well as preferences for particular Facebook features. The former was measured by asking for the average amount of time spent on Facebook per day (possible responses ranged from "10 min or less" to "More than 4 h"), while the latter was measured using a 5-point Likert-type scale (1 = "Dislike a great deal", 3 = "Neutral", and 5 = "Like a great deal"). Facebook nonusers were not required to complete this questionnaire.

### 2.3. Procedure

Ethical clearance was obtained from the RMIT University Human Research Ethics Committee. Participants were then recruited over a three week period between August and September 2010. Facebook users and nonusers were recruited through advertisements placed

[3] Chat is an instant messaging application that allows Facebook users to engage in real-time communication with their Facebook Friends.

[4] Status updates are short user-generated public messages that generally contain information about what the Facebook user is doing or thinking at that point in time.

[5] Photos is an application that allows Facebook users to upload personal photos, with or without captions, and share them with their Facebook friends.

in threads on six popular Australian online discussion forums – Best Recipes, Big Footy, Bub Hub, Essential Baby, MacTalk and VicHorse. Permission was obtained from the administrator or moderators of each forum prior to the posting of the advertisement. In addition to forum advertisements, a Facebook advertisement was also used to recruit Facebook users. This advertisement was specifically targeted to appear on the profile pages of Australian Facebook users between the ages of 18 and 44.

All participants were offered feedback on the BFI as an incentive to participate. Individuals who chose to participate in the study clicked either on the link provided in the forum thread, or directly on the Facebook advertisement. They were then taken to the online questionnaire package, which was hosted on the third-party website SurveyMonkey. After reading the PLS, participants were required to check a box indicating whether or not they agreed to participate in the study. Those that gave their consent to participate proceeded to the online questionnaire package, while those that did not were forwarded to a page thanking them for their time. In order to ensure that participation was limited to people meeting the inclusion criteria, the same procedure was followed for the questions relating to age and residency - people who indicated that they were not an Australian resident, or that they were under 18 or over 44, were diverted to the "thank you" page.

After completing all the items in the questionnaire, each participant was given their feedback on the BFI. In order to calculate which level of feedback was appropriate, each subscale was automatically scored and converted into a percentile rank following the procedure described in the BFI test manual (McConochie, 2007). For each of the five subscales, five different levels of feedback were created; low scoring (percentile ranks of 19 or less), moderate low scoring (percentile ranks between 20 and 39), average scoring (percentile ranks between 40 and 59), moderate high scoring (percentile ranks between 60 and 79), and high scoring (percentile ranks higher than 80). Participants received their percentile rank for each subscale, as well as a short explanation of what the score meant. For instance, a rank of 91 on the trait of extraversion received "You are an extremely fun loving, friendly, and affectionate person. You have lots of energy, and are usually very optimistic", while a rank of 12 received "You are a fairly introverted person. You feel quite comfortable spending time by yourself". This feedback was adapted from descriptions of the Big Five factors provided in Cervone and Pervin (2008). After participants had finished reading their feedback, they then clicked through to the thank you page and the questionnaire concluded. Raw data were then imported into the statistical software package *Predictive Analytics Software GradPack 18* and prepared for statistical analysis.

## 3. Results

For the purpose of analysis, data from Facebook users and nonusers were split into two groups. Wherever necessary, items were reverse scored and total and subscale scores were calculated. In order to deal with missing data, the mean score for each item was calculated and substituted for the missing value. Normality was tested for each of the personality measures by assessing stem-and-leaf plots and histograms. As the sample was large, skewness and kurtosis statistics were not calculated (Field, 2005). An alpha coefficient of .05 was used for all statistical tests.

### 3.1. Differences between Facebook users and nonusers

The mean scores of Facebook users and nonusers for each of the personality characteristics are presented in Table 1. In order to investigate whether people with certain types of characteristics were more likely to be Facebook users or nonusers, a series of single-factor between subjects multivariate analyses of variance (MANOVA) were performed. The first of these looked at the Big Five factors, and a significant multivariate effect was found, Wilks' $\Lambda = .98$, $F(5, 1318) = 6.56$, $p < .001$, multivariate $\eta^2 = .24$. Follow-up univariate analyses of each dependent variable revealed that Facebook users had significantly higher scores on extraversion, $F(1, 1322) = 19.48$, $p < .001$, $\eta^2 = .02$, and significantly lower scores on conscientiousness, $F(1, 1322) = 4.66$, $p = .031$, $\eta^2 = .01$, than nonusers.

The second MANOVA included the dependent variables shyness and loneliness, as well as the three sub-factors of loneliness: romantic, family, and social loneliness. Again, a significant multivariate effect was found, Wilks' $\Lambda = .98$, $F(5, 1318) = 5.66$, $p < .001$, multivariate $\eta^2 = .02$. Follow-up univariate analyses of each dependent variable found that Facebook nonusers were significantly more likely than users to be shy, $F(1, 1322) = 4.22$, $p = .040$, $\eta^2 = .01$, and to experience social loneliness, $F(1, 1322) = 19.40$, $p < .001$, $\eta^2 = .01$. On the other hand, Facebook users had significantly higher levels of family loneliness, $F(1, 1322) = 4.08$, $p = .044$, $\eta^2 = .01$, than nonusers. The dependent variables of total loneliness, $F(1, 1322) = .87$, $p = .35$, $\eta^2 = .01$, and romantic loneliness, $F(1, 1322) = .73$, $p = .39$, $\eta^2 = .01$, were not significant.

The final MANOVA included the dependent variable of narcissism, as well as two of its sub-factors – exhibitionism and leadership. Once again, a significant multivariate effect with these variables was found, Wilks' $\Lambda = .988$, $F(3, 1320) = 5.48$, $p = .001$, multivariate $\eta^2 = .01$. Follow-up univariate analyses revealed that Facebook users were significantly more likely than nonusers to have higher levels of total narcissism, $F(1, 1322) = 11.92$, $p = .001$, $\eta^2 = .01$, exhibitionism, $F(1, 1322) = 15.02$, $p < .001$, $\eta^2 = .01$, and leadership, $F(1, 1322) = 5.01$, $p < .025$, $\eta^2 = .01$.

### 3.2. Frequency of Facebook use

In regards to time spent using Facebook, 17% of users spent 10 min or less, 24% spent between 10 and 30 min, 23% spent between 31 and 60 min, 17% spent one to 2 h, and 19% spent 2 h or more on the site per day. The covariance between time spent on Facebook per day and each personality variable was calculated using Pearson's product-moment correlation coefficient (two-tailed). There was a significant positive correlation between time spent on Facebook per day and two of the personality variables: neuroticism, $r(1158) = .20$, $p < .001$, and total loneliness,

**Table 1**
Means (and standard deviations) of personality characteristics among Facebook users and nonusers.

| Characteristic | Facebook users ($n = 1158$) | Facebook nonusers ($n = 166$) |
|---|---|---|
| *Big Five* | | |
| Extraversion | 3.09 (.76) | 2.80 (.73) |
| Agreeableness | 3.56 (.55) | 3.51 (.55) |
| Conscientiousness | 3.36 (.55) | 3.47 (.64) |
| Neuroticism | 3.04 (.76) | 3.04 (.72) |
| Openness | 3.56 (.58) | 3.47 (.57) |
| *Shyness* | | |
| Total | 2.82 (.73) | 2.94 (.74) |
| *Loneliness* | | |
| Total | 3.07 (.94) | 3.16 (.98) |
| Romantic | 4.50 (.93) | 4.41 (.87) |
| Family | 4.43 (.59) | 4.32 (.59) |
| Social | 2.80 (1.24) | 3.18 (1.35) |
| *Narcissism* | | |
| Total | 10.28 (5.07) | 8.85 (4.20) |
| Exhibitionism | 1.80 (1.69) | 1.28 (1.35) |
| Leadership | 3.63 (2.16) | 3.23 (1.94) |

$r(1158) = .15$, $p < .001$. There was also a significant negative correlation between time spent on Facebook per day and conscientiousness, $r(1158) = -.14$, $p < .001$. There was no significant relationship between time spent on Facebook per day and shyness, $r(1158) = .04$, $p = .15$, or any of the sub-factors of loneliness – romantic, $r(1158) = .01$, $p = .60$, family, $r(1158) = .01$, $p = .64$, and social, $r(1158) = .04$, $p = .19$.

### 3.3. Preference for Facebook features

The most preferred Facebook features were Photos ($M = 3.70$, $SD = 1.57$), Messages ($M = 3.57$, $SD = 1.49$), the Wall ($M = 3.53$, $SD = 1.50$), and Status Updates ($M = 3.51$, $SD = 1.55$). Games ($M = 2.52$, $SD = 1.52$), Notes ($M = 2.73$, $SD = 1.21$), and Events ($M = 3.18$, $SD = 1.47$) were least preferred. Both the Wall (28.9%, $N = 335$) and Messages (23.2%, $N = 269$) appear to be the most preferred means of communication on Facebook.

The covariance between preferences for the communicative features of Facebook and the personality variables of extraversion and neuroticism were calculated using Pearson's correlation coefficient (two-tailed). Extraversion was significantly positively correlated with preferences for all of the communicative features of Facebook: Chat, $r(1158) = .09$, $p = .003$, Messages, $r(1158) = .15$, $p < .001$, Comments, $r(1158) = .09$, $p < .001$, and the Wall, $r(1158) = .13$, $p < .001$. On the other hand, the associations between neuroticism and the communicative features of Facebook were varied. There was a significant correlation between neuroticism and preference for the Wall, $r(1158) = .09$, $p = .003$, but not for Messages, $r(1158) = .05$, $p = .08$, Comments, $r(1158) = .05$, $p = .08$, or Chat, $r = -.03$, $p = .24$.

Pearson's correlation coefficients (two-tailed) were also calculated to investigate the relationship between preferences for Photos and Status Updates and narcissism. There were significant positive correlations between preference for Photos and narcissism, $r(1158) = .10$, $p = .001$, as well as the sub-factor of exhibitionism, $r(1158) = .14$, $p < .001$. There was no significant correlation between preference for Photos and leadership, $r(1158) = .04$, $p = .14$. There was also a significant positive correlation between preference for the Status Update feature and exhibitionism, $r(1158) = .06$, $p = .039$, however this relationship was not significant for total narcissism, $r(1158) = .03$, $p = .26$, or leadership, $r(1158) = .03$, $p = .92$.

### 3.4. Factor analysis

A principal component factor analysis with Varimax rotation revealed that preferences for Facebook features load into four factors: Active Social Contributions, Passive Engagement, News and Information, and Real-Time Social Interaction. Factor pattern coefficients for the four factors are presented in Table 2. The covariance between each personality variable and preferences for Facebook features (by factor) were calculated using Pearson's correlation coefficient (two-tailed). The results are presented in Table 3, and significant correlations are indicated.

## 4. Discussion

The current study aims to identify the personality characteristics associated with being a Facebook user or nonuser, and to examine whether these characteristics are related to the way people use the site. The results show that Facebook users are more likely to be extraverted and narcissistic, but they also have stronger feelings of family loneliness. On the other hand, Facebook nonusers are more likely to be conscientious, shy, and socially lonely. Furthermore, with the exception of romantic loneliness, all of the measured personality characteristics are significantly associated with differential preferences for particular types of Facebook features.

In terms of specific hypotheses, the prediction that extraverted people would be more likely to use Facebook than introverted people was supported. This result corresponds with previous research by Correa et al. (2010), and strengthens Tosun and Lajunen's (2010) argument that extraverted people use social networking sites as a means of social extension. Extraversion is also positively related to the use of the communicative features of Facebook, such as the Wall and Chat. This finding supports the hypothesis made in this study, but contradicts the findings of Ross et al. (2009). This may be because Facebook has undergone changes since Ross et al. (2009) performed their study. For instance, the recent addition of the Chat application may have increased the appeal that Facebook has for extraverted individuals. On the other hand, the differing results may be attributable to the fact that Ross et al. (2009) only looked at Facebook usage among university students.

**Table 2**
Factor loadings for exploratory factor analysis with varimax rotation of preferences for Facebook features.

| Feature | ASC | PE | NI | RTSI |
|---|---|---|---|---|
| Status | **.81** | .09 | .08 | −.07 |
| Wall | **.77** | .09 | .12 | .09 |
| Comments | **.76** | .23 | .07 | .06 |
| News feed | **.68** | .17 | .03 | .03 |
| Like | **.67** | .33 | .07 | .09 |
| Messages | **.61** | .00 | .13 | .41 |
| Photos | **.60** | −.17 | .37 | .09 |
| Groups | .18 | **.71** | .25 | .16 |
| Games | .05 | **.70** | −.08 | −.03 |
| Fan pages | .20 | **.69** | .25 | .10 |
| Events | .15 | .11 | **.75** | .03 |
| Notes | .07 | .14 | **.72** | .05 |
| Chat | .08 | .14 | .06 | **.93** |

*Note*: Factor loadings >.60 are in boldface. ASC = Active Social Contributions; PE = Passive Engagement; NI = News and Information; RTSI = Real-Time Social Interaction.

**Table 3**
Correlations between personality characteristics and factors of Facebook feature preference.

| Characteristics | Preference of Facebook features | | | |
|---|---|---|---|---|
| | ASC | PE | NI | RTSI |
| *Big Five traits* | | | | |
| Extraversion | .14*** | −.12*** | .01 | .11*** |
| Agreeableness | .06* | .02 | .06* | .05 |
| Conscientiousness | .03 | −.05 | −.08** | .05 |
| Neuroticism | .08** | .10*** | −.04 | −.05 |
| Openness | −.05 | .01 | .11*** | −.02 |
| *Shyness* | | | | |
| Total | −.05 | .11*** | −.04 | −.08** |
| *Loneliness* | | | | |
| Total | −.09** | .10*** | .01 | −.02 |
| Romantic | .04 | −.06 | −.01 | .03 |
| Family | .04 | −.01 | .08** | .08** |
| Social | −.10** | .09** | −.09** | −.04 |
| *Narcissism* | | | | |
| Total | .06* | −.10** | .06 | .04 |
| Exhibitionism | .09** | −.04 | .12*** | .06* |
| Leadership | .01 | −.08** | .04 | .04 |

*Note.* ASC = Active Social Contributions; PE = Passive Engagement; NI = News and Information; RTSI = Real-Time Social Interaction.
$N = 1158$.
* $p < .05$ (two-tailed).
** $p < .01$ (two-tailed).
*** $p < .001$ (two-tailed).

In regards to the predictions made about Facebook use and narcissism, both hypotheses are supported. Firstly, Facebook users have higher levels of total narcissism, exhibitionism, and leadership than Facebook nonusers. Secondly, individuals with higher scores on exhibitionism also have higher preferences for Photos and Status Updates. These findings validate previous research by Buffardi and Campbell (2008) and Mehdizadeh (2010), and substantiate the proposition that Facebook is particularly appealing for narcissistic and exhibitionistic people. In fact, it could be argued that Facebook specifically gratifies the narcissistic individual's need to engage in self-promoting and superficial behaviour.

The prediction that Facebook nonusers would have greater levels of loneliness than users has also been confirmed, although only for the sub-factor of social loneliness. Although there has been no previous research in this area, the obtained results are plausible because people with smaller social networks would generally be less motivated to use a website such as Facebook. However, as Correa et al. (2010) point out, the Internet is an increasingly user-generated environment, and individuals who choose not to engage may be limiting their ability to advance socially. Clearly, this is an area where further research is justified, as the results also show that Facebook users have significantly higher levels of family loneliness than nonusers. Furthermore, the finding that lonely people tend to spend more time on Facebook per day, and have higher preferences for the passive features of Facebook, is particularly concerning.

In regards to specific patterns of Facebook use, the first hypothesis states that shy people will spend more time on Facebook than non-shy people. However, the results show no significant relationship between shyness and frequency of Facebook use. These findings contradict those reported by Orr et al. (2009), and further suggest that results obtained from student populations are not always representative of typical Facebook users. In terms of Facebook usage habits, people with higher levels of neuroticism are more likely to prefer using the Wall. This result supports the hypothesis made in the current study, and provides additional evidence that neurotic people tend to prefer asynchronous forms of online communication (Ross et al., 2009). It also accounts for the fact that previous researchers have reported a negative relationship between neuroticism and use of instant messaging clients (Amiel and Sargent, 2004; Swickert et al., 2002).

### 4.1. Limitations and future research

Two major limitations associated with the current study need to be addressed. Firstly, the incentive of receiving feedback on the BFI personality measure may have motivated people who did not fit the inclusion criteria to lie in order to participate. In order to avoid this problem, researchers employing a similar methodology are advised to allow individuals from a wide range of ages and nationalities to participate. Responses from participants outside the desired ranges can then be removed at the data analysis stage, thus limiting the need for participants to lie. Secondly, the methods of recruitment employed in this study may have led to sample bias. In particular, the sample may have contained a higher than normal proportion of heavy Internet users. Furthermore, because the participants were recruited from Facebook and Internet discussion forums, the sample may have also been biased towards people who enjoy engaging in social interaction on the Internet. Researchers wishing to undertake further investigation in this area would do well to recruit participants on other types of websites, as well as using traditional offline methods of recruitment.

## 5. Conclusion

It is hoped that the results within this paper will serve as a foundation for the development of much needed psychological theory relating to the use of Facebook. While a few significant differences have been found between Facebook users and nonusers, for the most part the results of the current study suggests that Facebook appeals to individuals with a variety of characteristics. The data relating to more specific Facebook usage confirms this: Facebook gratifies its users in different ways depending on their individual characteristics. Unfortunately, an in-depth discussion of the specific results underlying this argument is beyond the scope of the current study. However, one of the most noteworthy findings was the tendency for neurotic and lonely individuals to spend greater amounts of time on Facebook per day than non-lonely individuals. For lonely people in particular, it appears that they are mainly using Facebook to partake in passive activities, instead of providing active social contributions. Such findings suggest that not all Facebook users are using the site to improve their social capital, unlike other research had implied (Burke et al., 2010; Ellison et al., 2007; Steinfield et al., 2008). However, due to the small effect sizes reported in the current study, these arguments require further validation. It is therefore recommended that researchers continue to examine the relationship between individual characteristics and specific patterns of Facebook usage, particularly in samples that are representative of typical Facebook users.

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