



## The effects of personality traits, self-esteem, loneliness, and narcissism on Facebook use among university students

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### ABSTRACT

This study examined the relationship between three of the “Big Five” traits (neuroticism, extraversion, and openness), self-esteem, loneliness and narcissism, and Facebook use. Participants were 393 first year undergraduate psychology students from a medium-sized Australian university who completed an online questionnaire. Negative binomial regression models showed that students with higher openness levels reported spending more time on Facebook and having more friends on Facebook. Interestingly, students with higher levels of loneliness reported having more Facebook friends. Extraversion, neuroticism, self-esteem and narcissism did not have significant associations with Facebook use. It was concluded that students who are high in openness use Facebook to connect with others in order to discuss a wide range of interests, whereas students who are high in loneliness use the site to compensate for their lack of offline relationships.

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### 1. Introduction

As well as providing access to information, the Internet has enabled people to establish and build relationships with others. Social networking sites, such as Facebook, are one method people use to connect with others socially on the internet (Bonds-Raacke & Raacke, 2010). Facebook is the predominant social networking site with more than 500 million active users (Facebook website, 2011). Typical users will spend anything from less than 10 min to more than 2 h per day on Facebook (Christofides, Muise, & Desmarais, 2009; Orr et al., 2009; Pempek, Yermolaveya, & Calvert, 2009; Raacke & Bonds-Raacke, 2008; Ross et al., 2009). One group that uses social networking sites extensively, particularly Facebook, is university students. Recent studies have found that over 90% of university students have Facebook accounts (Cheung, Chiu, & Lee, 2010; Pempek et al., 2009), and while it can be used to facilitate study students mainly use it to communicate with friends, look at photos and user profiles of other persons, and to pass the time, avoid boredom and procrastinate (Pempek et al., 2009).

#### 1.1. Personality and social networking

Over the past 3 years there has been a substantial increase in the number of peer-reviewed articles on social networking sites appearing in the literature. Several of these studies have investi-

gated how psychological factors such as personality traits influence the use of social networking sites (Amichai-Hamburger & Vinitzky, 2010; Correa, Willard Hinsley, & Gil se Zuniga, 2010; Ross et al., 2009; Ryan & Xenos, 2011; Wilson, Fornasier, & White, 2010). This research has typically involved the Five Factor Model or “Big Five” model of personality (FFM; Costa & McCrae, 1992) which posits that most of the variability in personality can be captured by five overarching dimensions: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. In general, researchers have used cut-off scores to divide participants into low and high trait groups and compared their mean time spent using social networking sites. However, this practice of dichotomising continuous variables is not recommended since it can hide meaningful relationships by reducing effect size and wasting statistical power (MacCallum, Zhang, Preacher, & Rucker, 2002).

Two of the most cited studies examining the relationship between the “Big Five” personality traits and Facebook are those of Ross et al. (2009) and Amichai-Hamburger and Vinitzky (2010). Ross et al. examined the effects of the “Big Five” on Facebook usage among 92 undergraduate students and found that participants who reported higher levels of extraversion were members of more groups on Facebook than those with lower extraversion levels, but no significant differences were found in the mean number of friends, time spent using Facebook, or the use of communicative features (e.g., messages) on Facebook. It was suggested that extraverts engage in more social activities on and off Facebook and use Facebook to maintain and enhance ties, but do not use Facebook as an *alternative* to social activities. Amichai-Hamburger and Vinitzky partially replicated the Ross et al. study using a larger sample of

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237 undergraduate students and found that participants high in extraversion reported having more friends compared to those low in extraversion. Consistent with Ross et al., Amichai-Hamburger and Vinitzky concluded that individuals transfer their offline behaviour online, which would explain the smaller social networks for introverts and the larger friends count for extraverts.

Neuroticism has been found to affect how individuals use Facebook but not the number of friends or groups memberships. For instance, Ross et al. (2009) reported that individuals with higher neuroticism levels were less willing to share personal information on Facebook, but preferred posting on the wall compared to uploading photos. This was attributed to autonomous and asynchronous nature of the wall, which allows individuals to control what is posted, when it is posted and for how long. Amichai-Hamburger and Vinitzky (2010) revealed that participants in the high neuroticism group were more inclined to upload photos than the low neuroticism group. In fact, participants with low and high levels of neuroticism were more inclined than the middle cohort to share personal information, though probably for different reasons.

The results from the remaining three traits indicated that individuals who score high on the openness use more features on Facebook compared to those individuals with low openness (Amichai-Hamburger & Vinitzky, 2010). It has been suggested that individuals with high openness would have wider interests and are more willing to pursue those interests, which Facebook permits. However, contrary to expectations, high agreeableness was not associated with having more friends on Facebook. Moreover, evidence for differences in Facebook use between low and high conscientiousness groups has been mixed.

Despite these findings, there is an emerging consensus that broad approaches to personality such as the FFM may not be the best predictors of online behaviour and that more specific individual difference constructs such as narcissism and loneliness may be preferable (Amichai-Hamburger & Vinitzky, 2010).

### 1.2. Other psychological factors predicting Facebook use

Researchers are increasingly investigating the relationship of psychological constructs other than the “Big Five” personality traits on social networking use. These include self-esteem (Ellison, Stenfield, & Lampe, 2007; Kalpidou, Costin, & Morris, 2011; Mehdizadeh, 2010; Wilson et al., 2010), loneliness (Amichai-Hamburger & Ben-Artzi, 2003; Kraut et al., 1998) and narcissism (Buffardi & Campbell, 2008; Mehdizadeh, 2010). There are mixed findings regarding the association between self-esteem and the use of social networking sites. For instance, in a sample of 100 university students, users with low self-esteem were found to check Facebook more often and spend more time on Facebook (Mehdizadeh, 2010). This finding is consistent with Ellison et al. (2007) who suggested that Facebook may help to compensate for low self-esteem, allowing these students to build social capital. In contrast, Gonzales and Hancock (2011) used analysis of variance (ANOVA) to analyse data from 63 students and reported that Facebook has a positive impact on self-esteem. Gonzales and Hancock put forward the argument that creating and updating one’s profile enhances self-esteem because users can select what information they present about themselves, and presenting only positive characteristics will enhance self-esteem. However, other studies have reported no significant association between self-esteem and Facebook variables (Kalpidou et al., 2011).

There has also been debate regarding the direction of causality in the relationship between loneliness and Internet use. Kraut and colleagues put forward the concept of the *internet paradox*, in which increased internet use was associated with greater feelings of loneliness (Kraut et al., 1998). On the one hand, high internet usage can isolate an individual physically, leading them to

experience increased loneliness (Kim, LaRose, & Peng, 2009). Conversely, individuals predisposed to loneliness have been found to engage in greater internet usage (Amichai-Hamburger & Ben-Artzi, 2003). This is likely to be because the internet provides individuals who are lonely with an opportunity to gain access to and interact with others online via social networking sites.

Given that users are encouraged to self-disclose when developing their user profiles or engaging with others on social networking sites, naturally researchers have investigated the role of narcissism in the use of such sites. For instance, Buffardi and Campbell (2008) found that higher levels of narcissism predicted more social interaction online and more information posted up about the self. Narcissists also tend to check their profiles more often and spend more time on Facebook (Mehdizadeh, 2010). It is likely that narcissists are drawn to the high levels of control available on social networking sites such as Facebook, because this allows them to present selected information to others and withhold other information. This is consistent with the notion that users in name identified environments such as Facebook have a preference for implicitly showing others who they are through uploading photos and joining certain groups rather than explicitly having to tell them via the About Me function (Zhao, Grasmuck, & Martin, 2008).

Although researchers are currently investigating associations between psychological factors and the use of social networking sites, it is important to note that one limitation in the literature has been the narrow focus of studies which have only examined the effects of one or two psychological variables on social networking site use, and not the simultaneous effects (i.e., the effect of extraversion in the presence of neuroticism) of multiple variables. Only a small number of studies have included measures of the “Big Five” personality traits alongside other psychological factors such as self-esteem, narcissism and loneliness. In one of the few studies to address this gap in the literature and investigate the relationships between multiple psychological variables and Facebook use, Ryan and Xenos (2011) investigated the “Big Five” personality traits, shyness, narcissism, loneliness and Facebook usage in a sample of 1635 self-selected Australian Internet users. The results from their online questionnaire showed that Facebook users are more extraverted and less conscientious than non-Facebook users. Facebook users also reported higher mean levels of narcissism compared to non-Facebook users. Yet it should be noted that a closer inspection of the results revealed only very weak relationships between Facebook use measures and the “Big Five” traits, shyness, loneliness and narcissism. There is a clear need for more research examining the simultaneous effects of multiple psychological factors on the use of social networking sites such as Facebook, particularly because it is likely that the behaviours do not have simple causes, but are multiply determined by a large number of interacting individual differences and contextual variables.

### 1.3. Use of appropriate statistical models and sample size issues

Another significant weakness of many Facebook studies is reliance on small samples (i.e.,  $N < 100$ ) and use of mean comparison designs instead of data models. Some researchers have used multiple regression, thus avoiding the compromise of dichotomising continuous variables. This also has the advantage of testing for the simultaneous effects of multiple predictors (e.g., the effects of extraversion in the presence of the effects of neuroticism). However, the studies that have used such techniques have used ordinary least squares regression which is a standard analysis of most statistical packages. Yet, many of the outcome variables for Internet use (such as time spent online or number of friends on Facebook) are count variables for which such methods are not suitable. Count variables take on only positive integer values or zero. Their distributions arise from different processes and are

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