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Running Title: Twitter vs. Facebook

A Tale of Two Sites: Twitter vs. Facebook and the
Personality Predictors of Social Media Usage

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Abstract

Social networking sites (SNS) are quickly becoming one of the most popular tools for social interaction and information exchange. Previous research has shown a relationship between users' personality and SNS use. Using a general population sample (N=300), this study furthers such investigations by examining the personality correlates (Neuroticism, Extraversion, Openness-to-Experience, Agreeableness, Conscientiousness, Sociability and Need-for-Cognition) of social and informational use of the two largest SNS: Facebook and Twitter. Age and Gender were also examined. Results showed that personality was related to online socialising and information seeking/exchange, though not as influential as some previous research has suggested. In addition, a preference for Facebook or Twitter was associated with differences in personality. The results reveal differential relationships between personality and Facebook and Twitter usage.

Keywords: Social Network Sites, Facebook, Twitter, Personality, Big-Five, Need for Cognition, Sociability

1.0 Introduction

The internet has become an essential component in the navigation of everyday life (Amichai-Hamburger & Vinitzky, 2010). The internet influences all aspects of human endeavour from the way in which organisations operate to the way people shop and spend their leisure time. Yet, perhaps the biggest transformations have been in the way in which we socialise and seek-out and spread information (Amichai-Hamburger & Ben-Artzi, 2000). Via the internet, vast amounts of information can be disseminated to worldwide audiences in an instant, whilst the web simultaneously offers an arena for public and private social interaction.

At the heart of online information transfer and social interaction (Raacke & Bonds-Raacke, 2008) are the most popular and fastest growing types of internet site (Nielsen-Wire, 2010): Social network sites (SNS). SNS can be defined as virtual collections of user profiles which can be shared with others. Despite the prominence of the internet and social networking in modern life, research concerning the antecedents of SNS use has been limited. However, there is now a small, but growing body of evidence that suggests individual differences are influential in guiding on-line behaviour (e.g. Amiel & Sargent, 2004; Ryan & Xenos, 2011).

In the current study, we seek to investigate further, the role of individual differences in the usage of SNS. Specifically, we examine how the personality traits of the Big-Five (Neuroticism, Extraversion, Openness-to-Experience, Agreeableness and Conscientiousness), Sociability and Need-for-Cognition relate to the social and informational use of the two largest SNS: Facebook and Twitter.

1.1 Facebook and Twitter

Facebook's popularity has grown exponentially over recent years, from 5.5 million active users in 2005 to around 500 million active users in 2011 (Facebook, 2011). Facebook

allows users to create a profile where they can post information about themselves ranging from their occupation, to their religious and political views to their favourite movies and musicians. On this profile, both the user and their 'friends' can post web links, pictures and videos of interest. Further, Facebook also offers the facility to send private and public messages to other users and even engage in real time instant messaging. All of these features coupled with the creation of applications, groups and fan pages make Facebook broadly popular for online socialising.

Although Facebook is the largest SNS, there are others. All social networking sites facilitate online, social interaction, yet they do not all offer the exact same services or have the same focus. The newest and perhaps most interesting SNS is Twitter, as its focus seems to be on the sharing of opinion and information (Kwak, Changhyun & Moon, 2010) rather than on reciprocal social interaction (Huberman, Romero & Wu, 2009).

Twitter allows users to update their account with short statements named "tweets" limited to 140 characters. Other users are able 'follow' these updates. The service is rapidly growing with recent statistics suggesting that in January 2010 alone Twitter attracted 73.5 million unique viewers, and from 2009-2010 it demonstrated an annual membership growth rate of 1,105% (TechCrunch.com, 2010). Twitter currently has in the region of two-hundred million registered accounts (Twitter, 2011).

Twitter, unlike Facebook offers the opportunity to reinstate some of the anonymity previously sought in online communication (Huberman et al., 2009). Users do not need to post information about themselves to find 'friends' and thus the site focuses less on 'who you are' and more on what you have to say (Huberman et al., 2009). The reduction of social pressure brought about by anonymity may mean that reasons for using Twitter differ from Facebook. It is expected that these differences will be evident in the relationships between personality and Twitter and Facebook usage.

1.2 Personality and Internet Usage

The following sections will review previous research linking the personality factors investigated here and internet use. There have been several studies that have researched links between personality and Facebook (e.g. Amichai-Hamburger & Vinitzky, 2010; Ryan & Xenos, 2011; Ross, Orr, Sisic, Arseneault, Simmering, & Orr, 2009). However, there are currently no studies linking Twitter use to personality. It must be noted that much of the extant research concerning personality and the internet has been conducted using small (less than 100) predominantly student samples. Thus, caution must be advised when interpreting the results obtained from any individual study.

1.2.1 The Big Five

In investigating the role of personality in the use of the internet, researchers have tended to use the Five-Factor-Model or Big-Five (e.g. Goldberg, 1990). The Big-Five consists of five broad personality traits, namely, Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness. Although the theoretical and methodological underpinnings of the model are not completely without dispute (see Block, 1995; 2010), it is regarded as acknowledging at least some of the essential aspects of personality (McCrae & Costa, 1999).

1.2.2 Neuroticism

Neuroticism is defined as a measure of affect and emotional control, with low levels suggesting good control over emotions and stability, whereas individuals with high levels may be somewhat sensitive and nervous with a propensity to worry (Costa & McCrae, 1992). Early opinions suggested that those high in Neuroticism were likely to avoid the internet (Tuten & Bosnjak, 2001). However, empirical enquiry has failed to support this hypothesis. It is now considered that those high in Neuroticism use the internet frequently, mostly to avoid loneliness (e.g. Butt & Phillips, 2008; Amichai-Hamburger & Ben Artzi, 2003). Indeed,

positive correlations have been found with the amount of time spent on Facebook ($r = .20$; Ryan & Xenos, 2011) and frequency of instant messenger use ($r = .12$; Correa, Wilard & Zuniga, 2010).

The loneliness theory is also supported by research demonstrating modest correlations with the social use of Facebook ($r = .08$; Ryan & Xenos, 2011) and the internet more generally ($r = .57$; Amichai-Hamburger & Ben-Artzi, 2000). Amichai-Hamburger and Ben-Artzi (2003) found high levels of Neuroticism in females was correlated with social usage of the internet ($r = .32$). In the same study, a negative relationship was reported between Neuroticism and use of the internet for informational purposes ($r = -.27$).

Thus, previous research has shown Neuroticism to be related to greater internet use particularly in relation to social uses. It appears that those high in Neuroticism use the internet as a tool to decrease feelings of loneliness and create a sense of group belonging (Butt & Phillips, 2008; Amichai-Hamburger & Ben-Artzi, 2003). It may thus be hypothesised that those who score highly on Neuroticism will use Facebook and Twitter more often, primarily for socialising (H1).

1.2.3 Extraversion

Extraverts are typically adventurous, sociable and talkative, whereas introverts are typically quiet and shy (Costa & McCrae, 1992). Extraversion has been shown to correlate with the use of instant messaging and SNS ($r = .14$; Correa, Hinsley & Zuniga, 2010). Within Facebook, those high in Extraversion have been shown to be members of significantly more 'groups' (Ross, et al., 2009) and have significantly more 'friends' (Amichai-Hamburger & Vinitzky, 2010). Many of these 'friendships' it seems were not initiated online however. Extraverts tended to make the friends offline, then use the internet to keep in touch (Ross, et al., 2009), suggesting that Extraverts do not see online socialisation as a substitute for offline communication.

Ryan & Xenos (2011) found significantly higher levels of self-reported Extraversion in Facebook users compared to non-users and also found Extraversion to be correlated with the social use of Facebook ($r = .14$). Amichai-Hamburger and Ben-Artzi, (2000) also found a significant correlation between social use of the internet and Extraversion, however only for females. Issues concerning sample size must be readdressed here as the sample of females was twenty-seven. The same authors also report a whole sample ($N=72$) correlation between Extraversion and informational use of the internet ($r = .24$; Amichai-Hamburger & Ben-Artzi, 2000).

On the basis of previous research, we hypothesise that there will be a positive correlation between Extraversion and the social use of Facebook (H2). However, the relationships may not be so straightforward between Extraversion and Twitter. It might be expected that the potential for increased anonymity (i.e. through alias usernames) and the reduced emphasis on social interaction offered by Twitter may appeal to those who report themselves lower in Extraversion (H3).

1.2.4 Openness-to-Experience

Individuals who demonstrate high Openness-to-Experience (Openness) have broad interests and seek novelty, with low ratings linked to preferring familiarity and convention (McCrae & Costa, 1987). Openness has been shown to correlate with the use of instant messaging and SNS ($r = .10$; Correa, Hinsley & Zuniga, 2010) and with the use of a wider variety of Facebook features (Amichai-Hamburger & Vinitzky, 2010). Further, Openness has been shown to be related to information seeking (McElroy, Hendrickson, Townsend & DeMarie, 2007). Thus, it may be hypothesised that positive correlations will be observed between Openness and both social and informational uses of SNS (H4).

1.2.5 Agreeableness

Agreeableness is seen as a measure of how friendly people are, with high ratings being associated with individuals who are kind, sympathetic and warm (Costa & McCrae, 1992). It has been suggested that less agreeable individuals would have greater numbers of online contacts as the internet provides a means to build friendships that may prove difficult to initiate and maintain offline (Ross et al., 2009). However, Agreeableness has been included in several studies relating to internet and social media usage and has generally been found to be unrelated (Ross et al., 2009; Correa, Hinsley & Zuniga, 2010; Amichai-Hamburger, & Vinitzky, 2010). The kind and warm nature of Agreeable persons may result in a positive correlation with social uses of SNS. However, it is expected that Agreeableness will be unrelated to both social and informational use of Facebook and Twitter (H5).

1.2.6 Conscientiousness

Conscientiousness refers to a person's work ethic, orderliness and thoroughness (Costa & McCrae, 1992). It has been suggested that Conscientious individuals are inclined to avoid SNS as they promote procrastination and serve as a distraction (Butt & Phillips, 2008) from more important tasks. However, Ross et al., (2009) failed to provide empirical support for such suggestions, finding no significant correlation between Conscientiousness and Facebook activities. However, Ryan and Xenos (2011) did find a significant negative correlation between Conscientiousness and the amount of time spent on Facebook ($r = -.14$). Similar trends were also uncovered by Amichai-Hamburger and Vinitzky (2010) who found that despite highly conscientious individuals having more friends than those low in the trait, that they uploaded significantly fewer pictures to the site (Amichai-Hamburger & Vinitzky, 2010)

Thus, it is expected that Conscientiousness will have a negative correlation with the social aspects of both Facebook and Twitter (H6). However, the relationship between

Conscientiousness and Informational use of SNS is less clear. Conscientious individuals may well use SNS to gather information that is relevant to their current work (H7). It might also be the case that the short, quick fire nature of Twitter usage determined by the limit of 140 characters per 'tweet' may appeal to those high in Conscientiousness as they can still partake in social networking without it becoming a temporal distraction.

1.2.7 Narrow Personality Facets

Numerous authors have suggested that the Big Five dimensions may be too broad to capture some of the nuanced relationships between personality and online behaviour (e.g. Ross et al., 2009). With a view to capturing such relationships and given that the focus of this study is the social and informational use of Facebook and Twitter, it is hypothesised that the lower-order, narrow personality facets of Sociability and Need for Cognition will be influential in predicting online socialising and information seeking/exchange.

1.2.8 Need for Cognition

Need for Cognition (NFC) is related to an individual's propensity to seek out cognitive stimulation (Verplanken, 1993) and can be defined as the tendency to engage with and enjoy information and cognitive endeavours (Cacioppo & Petty, 1982). Amichai-Hamburger, Kaynar and Fine (2007) investigated the relationship between website interactivity and NFC. They found few significant effects. In a follow up study, Amichai-Hamburger and Kaynar (2007) found that NFC did not correlate with the use of social aspects of the internet, but did correlate with the use of "Professional Services" which includes obtaining information for studies. It is expected that NFC will show positive correlations with informational uses of SNS, but not social (H8).

1.2.9 Sociability

Those high in Sociability have a tendency to enjoy conversation, social interaction and being the centre of attention, whereas individuals who score low on measures of

Sociability prefer solitary activities and will not actively seek conversation (Lee & Ashton, 2004). Gangadharbatla (2008) found a high need to belong, which is considered a similar construct to Sociability (Leary, Kelly, Cottrell & Screindorfer, 2006), to be positively related to favourable attitudes towards SNS and willingness to join SNS.

Sociability is widely discussed in computer literature and is acknowledged as being an important part of virtual communities (see Preece, 2001). Although it seems logical to suggest that individuals who are more sociable will use SNS more often and primarily for socialising, research is yet to empirically examine this assumption. The current study will go some way to redress this shortfall. It is expected that Sociability will positively correlate with the social use of SNS, but will be uncorrelated with informational use (H9).

1.3 Hypotheses

H1: Neuroticism will be positively correlated with social use of both Facebook and Twitter.

H2: Extraversion will be positively correlated with use of Facebook.

H3: Extraversion will be negatively related to use of Twitter.

H4: Openness will be correlated with both social and informational use of both Facebook and Twitter.

H5: Agreeableness will be unrelated to social network use.

H6: Conscientiousness will be negatively correlated with social use of both Facebook and Twitter.

H7: Conscientiousness will be positively correlated with informational use of SNS.

H8: NFC will be positively correlated with informational use of Facebook and Twitter, but will be unrelated to social use.

H9: Sociability will positively correlate with the social use of Facebook and Twitter, but will be unrelated to informational use.

1.4 Summary

The internet and SNS have transformed how we seek information and communicate with each other and are fast becoming one of the most dominant outlets for social interaction and information sharing. With more and more individuals using SNS sites, it is important that we understand who is using the sites and for which reasons. Previous studies have begun to consider how individual differences impact upon online behaviour. The current study seeks to further elucidate the relationship between personality and SNS use by investigating the informational and social use of Facebook and Twitter.

2.0 Method

2.1 Participants

Participants were recruited via an advertisement posted on both Twitter and Facebook. Participants provided informed consent and a charitable donation was made on the behalf of each respondent. The resultant general population sample numbering 300 (97 males, 31%; 207 females, 69%) included participant aged from 18 to 63 ($M = 27$, $SD 8.98$). Seventy percent of respondents were European, 18% were from North America, 9% were from Asia with 3% from other continents. In all, 55% of participants were employed, 41% were students and 4% were unemployed.

2.2 Measures

Three existing personality measures, a newly developed scale measuring Twitter and Facebook usage and demographic questions concerning age, sex, employment status and continent were collated into a single online questionnaire. Online measures have been shown to attract samples that are diverse with regard to age, gender, geographic region and socio-economic status (Gosling, Vazire, Srivasta & John, 2004). All scales used a common likert-type response format with individuals choosing from seven options: Strongly Disagree (1) to Strongly Agree (7).

Facebook and Twitter use: In the absence of any pertinent measures of Facebook and/or Twitter usage, a measure was developed specifically for this study. Twelve questions were designed to assess participants' usage of the two social network sites in relation to preference for Facebook or Twitter, frequency of use and the use of Facebook and Twitter for socialising and information gathering/spreading. The Facebook and Twitter use scale is displayed in Table 1.

Big Five: Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness were assessed using the 44-item Big Five Inventory (BFI; John & Srivastava, 1999). Items involve questions about typical behaviours, for example "*I am talkative.*" The scale is reported to possess adequate internal consistencies ranging from 0.75 – 0.90 (John & Srivastava, 1999).

Sociability: This was assessed using the IPIP Sociability scale (Goldberg, 1999) developed to resemble the sociability scale as measured by the HEXACO (Lee & Ashton, 2004). An example item is "*I Makes friends easily.*" The scale has been shown to possess adequate reliability ($\alpha = 0.85$; Goldberg, 1999).

Need for Cognition: Participants' Need for Cognition was assessed using the IPIP (Goldberg, 1999) version of the Need for Cognition scale (Cacioppo, Petty & Kao, 1984). An example item is "*I like to solve complex problems.*" Goldberg (1999) reports this scale to possess an acceptable reliability with a Cronbach's alpha of 0.84.

3.0 Results

To assess the relationship between personality and social network usage, we first sought to identify reliable structures for each of the variables through the use of exploratory and confirmatory factor analysis. Next, using the identified structures, we proceeded to build regression models between the personality variables and Facebook and Twitter use in a

stepwise fashion. Finally, we examined whether there were differences in personality based on which SNS participants preferred to use. All analyses were conducted using *Mplus* 6.0 (Muthen & Muthen, 2010) or SPSS 16.

3.1 Social Network Use

Participants average social network usage ranged from 0.25 to 25 hours per week ($M=3.24$, $SD=3.20$). The covariance between time spent using SNS and each of the personality variables was calculated using the Pearson's product-moment correlation coefficient (two-tailed). The only significant correlation was due to Conscientiousness ($r = -.14$, $p < 0.05$). The majority of participants reported accessing social network sites from home ($n=244$, 80%), whilst some predominantly accessed SNS from work ($n=23$, 13%). Further, the majority of participants accessed SNS using a laptop computer ($n=198$, 66%) as opposed to desktop computers ($n=61$, 20%) and mobile devices ($n=41$, 14%).

3.2 Exploratory Factor Analysis

Exploratory Factor Analysis (EFA) was conducted on the twelve Facebook and Twitter use items using the Weighted Least Squares Means and Variances (WLSMV) method of estimation and the oblique Geomin rotation. Likert-type data is ordinal, not continuous and as such is theoretically suited to WLSMV, which makes no assumptions regarding distribution or levels of measurement (Browne, 1974).

The EFA revealed the twelve Facebook and Twitter use items to be explicable by four factors. We interpret the first factor as being concerned with the use of Twitter for informational purposes (Twitter Info). The second factor was interpreted as a measure of Facebook for socialising (Facebook Social), whilst the third factor was interpreted as a measure of using Twitter for socialising (Twitter Social). The fourth factor was considered a measure of use of Facebook for informational purposes (Facebook Info). The solution accounted for 69% of the total variance and retained all 12 items. The pattern matrix for the

solution, including items is displayed in Table 1. Unweighted mean scale scores for each of the factors, namely, Facebook Info, Facebook Social, Twitter Info and Twitter Social were calculated and used as the dependent variables in all subsequent analyses.

[Insert Table 1]

3.3 Confirmatory Factor Analysis (CFA)

Next, confirmatory factor analyses (CFA) were conducted to test single factor solutions for the personality scales (Neuroticism, Extraversion, Openness, Agreeableness, Conscientiousness, Sociability and Need for Cognition). Item level models were estimated using WLSMV. When assessing model fit, a range of the more reliable fit indices (Hu & Bentler, 1999) were consulted, namely, the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI). In the case when items comprised the indicators, the Weighted Root Mean Residual (WRMR) was also used, when parcels comprised the indicators, the Standardized Root Mean Square Residual (SRMR) was consulted. The SRMR is only calculable with continuous data; and parcelled indicators closely approximate continuous data (Coffman, & MacCallum, 2005). Models were considered to adequately model the data at values of $\leq .08$ for the SRMR (Spence, 1997) and the RMSEA (Browne & Cudeck, 1993), values below 1 for the WRMR and values $\geq .90$ for the CFI and TLI, (Bentler & Bonnett, 1980) with values above .95 preferred (Hu and Bentler, 1999).

As can be seen from Table 2, all initial models failed to fit. A series of further models were tested using the modification indices as a guide. Across all seven models, the modifications resulted in the removal of 13 items (BFI 3, 11, 16, 28, 30, 33, 35, 37; Sociability 4, 9; Need for cognition 2, 8, 9)¹ and the modelling of 9 correlated disturbances. Following these modifications all revised scales achieved good fit (see Table 2).

[Insert Table 2]

3.4 Measurement Model

Next, item parcels were created for each variable. Items were parcelled based on the single-factor method suggested by Landis, Beal and Tesluk (2000). However, where correlated errors had been modelled, these items were placed in the same parcel regardless of the magnitude of their factor loadings. Three parcels per factor were created, satisfying the minimum requirement for model identification (Bollen, 1989, p. 88–89). All analyses using parcelled variables were conducted using Maximum-Likelihood estimation since the use of item parcels provides a close approximation to continuous measurement.

In order to assess the appropriateness of the parcels, a measurement model was estimated which included all of the personality variables and SNS usage variables. The initial measurement model showed poor fit ($X^2= 544.173$, $df= 203$, $CFI = .902$, $TLI = .867$, $RMSEA = .075$, $SRMR= .063$). A single item parcel was removed from the Agreeableness variable since it was related to eight modification indices larger than 20. Further, two cross factor loadings were modelled (Extraversion parcel 3 onto Sociability; Openness parcel 2 onto Neuroticism). Following these modifications, the measurement model demonstrated adequate fit ($X^2= 344.018$, $df= 179$, $CFI = .950$, $TLI = .929$, $RMSEA = .055$, $SRMR= .046$).

3.5 Correlational Analysis

Having identified reliable structures for each of the variables, the four Facebook and Twitter usage variables were analyzed in terms of their correlations with each of the personality variables. All correlations are shown in Table 3. Not all personality variables were significantly correlated with Facebook and Twitter use. Contrary to our hypothesis (H9), Sociability returned the largest correlations with both Twitter Info (-.317) and Facebook Info (.344). The pattern of significant personality correlations with Twitter Info and Facebook Info are diametrically opposed, suggesting that personality is an influential factor in determining whether a person will seek or distribute information using either Facebook or

Twitter. Conscientiousness showed the largest correlation with Twitter Social, whilst Sociability reported the largest correlation with Facebook Social.

[Insert Table 3]

3.6 Structural Equation Modelling

With the goal of assessing the level of covariance between personality and SNS usage, four separate sets of stepwise fashion regressions in SEM, based on the revised measurement model were estimated, one for each of the usage variables (Facebook Info, Facebook Social, Twitter Info, Twitter Social). In each analysis, the personality variable with the largest correlation was taken as a baseline, with all other variables regressed alongside this trait. The highest predictive pairing was then taken as a new baseline model, with all remaining variables then regressed with this pair. This iterative process was continued until insignificant additional variance was explained by adding further personality variables. Finally, the demographic variables of Sex, Age and Employment Status were regressed alongside the most predictive personality model. Models were estimated using Maximum Likelihood estimation. The results are shown in Table 4.

[Insert Table 4]

The results in Table 4 reveal the most predictive model of Twitter Info to consist of Sociability, Need for Cognition and Age which collectively accounted for 20.8% of the variance (Table 4, Model C). The same personality variables (Sociability, Need for Cognition, Age) were also significant predictors of Facebook Info, accounting for 15.8%. However the direction of the relationship was the opposite reported for Twitter Info. Twitter Social shared the most variance with the combination of Conscientiousness and Openness (12.3% variance; Table 4, Model E) whilst the combination of Sociability, Neuroticism and Age accounted for 9.4% of the variance in Facebook Social.

3.7 Personality differences by social network site preference

In addition to investigating whether personality is influential in determining which site is used for social and informational purposes, it was analysed whether a preference for Facebook or Twitter was associated with differences in personality. Participants were asked to indicate which SNS they preferred to use. One-hundred and ninety-seven preferred to use Facebook, whilst 103 favoured Twitter. In order to assess whether there were significant differences in personality dependant SNS preference, a series of one-way ANOVAs were performed. Significant mean differences were observed in NFC, Sociability, Extraversion and Neuroticism. No significant differences were found in the traits of Openness, Agreeableness and Conscientiousness. The results indicate that those who have a preference for Facebook see themselves as higher in Sociability, Extraversion and Neuroticism but lower in NFC (see Table 5).

[Insert Table 5]

4.0 Discussion

The current study aimed to identify some of the personality characteristics associated with the social and informational use of Facebook and Twitter. We found that a number of personality factors were significantly correlated with SNS use (Table 3). Different traits were influential in explaining social and informational use and personality differences between the use of Facebook and Twitter were also identified. Further, significant differences in personality were observed between those who preferred Facebook and those who preferred Twitter.

4.1 Social use of SNS

4.1.1 Facebook

Only two of the personality variables examined were found to correlate significantly with Facebook Social: Sociability ($r = .164$) and Neuroticism ($r = .152$) which together

accounted for 4.6% of the variance in usage. These results provide support for hypothesis 1 and 9 and add further support to the Neuroticism-loneliness hypothesis (e.g. Butt & Phillips, 2008; Amichai-Hamburger & Ben Artzi, 2003) as those who are more socially oriented and high in Neuroticism seek social contact via Facebook. Age accounted for a further 4.6% of the variance, making age the most predictive variable measured. Collectively, the results reveal that younger individuals, higher in Sociability and Neuroticism were more likely use Facebook for social reasons. The non-significant correlations observed between Facebook Social and Extraversion, Openness and Conscientiousness fail to offer support for H2, 4 and 6. In totality, these results are contradictory to some previous research (e.g. Amichai-Hamburger and Ben-Artzi, 2000; Correa, Hinsley & Zuniga, 2010) and suggest that using Facebook for social endeavours is largely unrelated to many aspects of personality and surprisingly is not related to purely hedonic endeavours or procrastination. However, the null relationship with Extraversion can be interpreted as consistent with research by Amiel and Sargent (2004) who found that those high in Extraversion do not use the Internet as a substitute for offline communication.

The correlations due to Sociability and Neuroticism were hypothesised and replicate previous research (Amichai-Hamburger & Ben Artzi, 2000; Amichai-Hamburger & Ben Artzi, 2003; Correa, Hinsley & Zuniga, 2010; Ryan & Xenos, 2011). However, the magnitude of these correlations is surprising. The personality traits examined here and age account for just 10% of the variance in Facebook Social, leaving 90% unexplained. Facebook is used by vast numbers of people and is primarily viewed as a social platform. Thus, due to the all-encompassing social nature of Facebook, it may be the case that very little variation in *whether or not* individuals use Facebook for socialising exists. However, variation may well be present in *how* individuals socialise online. More nuanced measures such as number of

status updates, frequency of instant message conversations, number of wall posts and private messages need to be examined in order to test this hypothesis.

4.1.2 Twitter

Conscientiousness, Openness and Sociability all showed significant correlations with Twitter Social supporting H4, 6 and 9 and suggesting that the use of Twitter to socialise is related to higher Openness, Sociability and lower Conscientiousness. The lack of association between Neuroticism and Twitter social (contrary to H1), may suggest that in contrast to Facebook, users do not see Twitter as a tool to mitigate loneliness. The typical Twitter socialiser may therefore have broad interests and enjoy socialising (but not necessarily to avoid loneliness) which may serve to increase levels of procrastination and decrease time spent on goal-directed behaviours.

4.2 Informational use of SNS

4.2.1 Facebook

Facebook Info was positively correlated with Neuroticism, Extraversion, Openness and Sociability replicating extant literature (e.g. Amichai-Hamburger & Ben-Artzi, 2000) and providing support for hypotheses 1 and 4, but was negatively correlated with Conscientiousness and NFC contrary to hypotheses 8 and 9. The negative correlation with both Conscientiousness and NFC may suggest that in contrast to socialising, informational uses of Facebook may well be indicative of procrastination, a lack of self-discipline and diligence.

The stepwise regression revealed that a combination of Sociability ($\beta = .335$), Need for Cognition ($\beta = -.119$) and Age ($\beta = -.145$) accounted for 15.8% of the variance. The positive relationship of Sociability may reflect the social nature of Facebook even when seeking or distributing information. It might be hypothesised that when in pursuit of information, Facebook users will socialise to find that information; perhaps by posting

questions in their 'status update' or conversing through instant messages. If those who seek or distribute information via Facebook choose to do so largely through social interaction, perhaps they choose such methods over more cognitively demanding information gathering techniques such as reading news paper articles and research reports. This hypothesis may also explain the negative correlation between NFC and Facebook Info.

4.2.2 *Twitter*

The use of Twitter for informational purposes was found to correlate positively with Conscientiousness and Need for Cognition (supporting H7 and 8) and negatively with Neuroticism, Extraversion (Supporting H3) and Sociability (contrary to H9). Collectively, these results suggest that those who access Twitter for informational purposes are doing so for its utilitarian value and cognitive stimulation. The model which accounted for the greatest proportion of variance (20.8%) in Twitter Info consisted of Sociability ($\beta = -.313$), Need for Cognition ($\beta = .219$) and Age ($\beta = .192$; Table 4, model I). This model suggests that information sought on Twitter appeals to older persons with a higher Need for Cognition who do not wish to Socialise. These results are perhaps not wholly surprising when we consider the informational focus of Twitter, which also offers the opportunity for user anonymity.

Both the final Facebook and Twitter Info models consist of the same variables. Surprisingly however, each of the personality variables (and Age) is correlated in the opposite direction (see Table 3). The diametrically opposed relationships suggest that individuals who seek and spread information on Facebook do not also use Twitter for the same purpose and vice versa. In totality, the results reveal that younger, more sociable individuals who have a low NFC use Facebook to find and distribute information, whilst older, less sociable individuals who have a greater NFC and higher levels of Conscientiousness use Twitter. Thus, suggesting that Facebook and Twitter are used for different things by different people. Speculatively, it might be argued that these relationships

are driven by the type of information sought. For instance, information sought from Facebook may be obtained socially (i.e. by asking other users), whereas the information sought on Twitter might be more cognitively based, such as academic or political information that is best gained by reading source materials, for which links are often 'tweeted'. Equally, the correlations with Conscientiousness suggest that informational use of Twitter may be goal-directed, perhaps seeking information relevant to work or study; whereas for Facebook, information seeking may be the manifestation of procrastination.

4.3 SNS preference

Alongside personality differences in how SNS are used, user preference for Facebook or Twitter was also associated with differences in personality. A series of one-way ANOVAs revealed that those who rate themselves higher in Sociability, Extraversion and Neuroticism had a preference for Facebook, whilst those who had a preference for Twitter were higher in NFC (Table 5). These results suggest that those who are generally more gregarious and sociable will look to use Facebook more often, whilst less sociable individuals who are seeking cognitive stimulation will look to use Twitter. These results may well be the manifestation of the different styles of the two SNS, as Twitter, unlike Facebook offers greater user anonymity and focuses less on 'who you are' and your extant social circles and more on what you think and wish to say (Huberman et al., 2009). These differences in emphasis would appear to be evident in the relationships with personality.

4.4 Limitations

A number of limitations must be considered when interpreting the results of the current investigation. First, the relatively modest sample size recruited via snowball sampling resulted in the overrepresentation of young (below 28 years of age) female students. The overrepresentation of such populations means the generalisability of these findings to other

populations is somewhat questionable and replications using more representative samples must be conducted.

Second, when interpreting the observed relationships it must also be considered that the use of self-report measures for both the predictor and outcome variables may have resulted in method bias, serving to inflate model parameter estimates. In order to counteract the effects of method bias, future research should aim to collect objective measures of SNS use.

4.5 Implications and Future Research

The results obtained in the current study reveal personality to be an influential factor in online information seeking and socialising. In particular, the narrow personality facets of Sociability and Need for Cognition showed larger correlations with Facebook and Twitter use than the Big Five. This suggests that narrow personality facets may be better suited than broad, higher order factors to investigating online behaviour (e.g. Ross et al., 2009). Thus, further research should concentrate on uncovering additional narrow traits that may help us to understand better individual online behaviour. However, it must be noted that whilst personality does appear influential, it is perhaps less so than previously thought. The variables investigated here accounted for between 10 and 20% of the variance, leaving around 80-90% unexplained. Thus, in addition to seeking out further narrow personality traits, researchers should also seek to identify other individual difference variables such as motivation, self-efficacy, intelligence and attitudinal variables as well as demographic variables such as number of dependents, educational attainment, marital status and occupational group that might be influential. The study of a broader base of variables might improve our understanding of SNS use and online behaviour more generally.

The current findings also reveal that the effects of personality on SNS usage are dependant upon the site studied. This result suggests that in the same manner as we would not

assume the same personality traits are hugely influential in all offline behaviours, we should not assume all online behaviours are underlain by the same individual differences. Future research should endeavour to investigate the antecedents of specific online behaviours not 'online behaviour' as a whole.

Conclusion 4.6

The current study investigated whether the personality traits of the Big-Five, NFC and Sociability were related to socialising and information exchange in the online environment of SNS. Results showed that personality was related, that these correlations were not straightforward or as influential as some previous research has suggested. In addition, the results reveal differential relationships between behaviours on Facebook and Twitter and show personality differences between those who have a preference for Facebook or Twitter, suggesting that different people use the same sites for different purposes. Future research must uncover the additional influential factors (be those additional personality traits or other variables) behind this differential use of SNS.

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Footnotes

1. Item numbers reported conform to those reported by scale authors. For BFI see John & Srivastava (1999); for NFC and Sociability see Goldberg (1999).

Table 1Four factor model of Facebook and Twitter use

Item	Factor 1	Factor 2	Factor 3	Factor 4
I use Twitter to find and spread information	.693			
Twitter is primarily for information	.685			
I use Twitter to keep abreast of current events	.607		.425	
I use Facebook to keep in touch with friends		.904		
I use Facebook because my friends do		.608		
Facebook is primarily for socialising		.514		
I use Twitter to keep in touch with friends			.908	
I use Twitter because my friends do			.746	
Twitter is primarily for socialising			.544	
I use Facebook to find and spread information				.808
I use Facebook to keep abreast of current events				.660
Twitter is primarily for information				.606
Eigenvalues	3.112	2.112	1.839	1.261
Cronbach's Alpha	0.817	0.630	0.625	0.730

Table 2

Item level Confirmatory Factor Analysis of all personality variables

Scale		X^2	df	CFI	TLI	RMSEA	WRMR
Neuroticism		171.859	27	.927	.903	0.134	1.042
	<i>Revised</i>	<i>24.424</i>	<i>12</i>	<i>.992</i>	<i>.986</i>	<i>0.059</i>	<i>0.405</i>
Extraversion		283.001	20	.926	.896	0.209	1.419
	<i>Revised</i>	<i>68.113</i>	<i>9</i>	<i>.980</i>	<i>.966</i>	<i>0.088</i>	<i>0.684</i>
Openness		257.129	35	.935	.917	0.145	1.245
	<i>Revised</i>	<i>42.788</i>	<i>19</i>	<i>.991</i>	<i>.987</i>	<i>0.065</i>	<i>0.544</i>
Agreeableness		156.784	27	.904	.873	0.127	1.044
	<i>Revised</i>	<i>45.675</i>	<i>17</i>	<i>.973</i>	<i>.956</i>	<i>0.075</i>	<i>0.586</i>
Conscientiousness		196.432	27	.925	.899	0.145	1.091
	<i>Revised</i>	<i>5.636</i>	<i>5</i>	<i>.999</i>	<i>.998</i>	<i>0.021</i>	<i>0.267</i>
Need For Cognition		595.409	35	.865	.826	0.231	1.926
	<i>Revised</i>	<i>35.656</i>	<i>12</i>	<i>.991</i>	<i>.985</i>	<i>0.081</i>	<i>0.496</i>
Sociability		276.549	35	.951	.937	0.152	1.049
	<i>Revised</i>	<i>64.369</i>	<i>19</i>	<i>.987</i>	<i>.981</i>	<i>0.089</i>	<i>0.539</i>

Table 3

Correlations between SNS use and the personality scales from the standardized measurementmodel

	1	2	3	4	5	6	7	8	9	10	11
1 Twitter Info	-										
2 Twitter Social	.228**	-									
3 Facebook Info	-.250**	.089	-								
4 Facebook Social	-.029	.029	.553**	-							
5 Neuroticism	-.198*	.053	.166*	.152*	(.93)						
6 Extraversion	-.232*	.143	.233**	.016	-.079	(.89)					
7 Openness	-.074	.247**	.222**	.002	-.001	.449**	(.94)				
8 Agreeableness	.119	.167	-.028	.032	-.374**	.234**	.278**	(.91)			
9 Conscientiousness	.150*	-.260**	-.144*	-.028	-.389**	-.090	-.153*	.152*	(.90)		
10 Sociability	-.317**	.219*	.344**	.164*	-.050	.852**	.391**	.482**	-.129*	(.94)	
11 Need for Cognition	.309**	-.008	-.169*	-.044	-.422**	-.007	.378**	.130	.288**	-.081	(.97)

Note: * = $p < .05$; ** = $p < .001$; Numbers in diagonal denote scale reliability as calculated

using equations from Fornell and Larcker (1981) that were developed specifically to evaluate the reliability of latent factors.

Table 4

Model summaries and fit statistics for latent variable regression models

Model	R	B	χ^2	df	CFI	TLI	RMSEA	SRMR
Twitter Info								
A: Sociability	10.1	-.318**	5.245	5	1.000	.999	0.017	0.018
B: Sociability & Need for Cognition &	17.5	-.284** .273**	25.896	18	.990	.985	0.050	0.028
C: Sociability & Need for Cognition Age	20.8	-.313** .219** .192*	29.419	23	.992	.988	0.039	0.026
Twitter Social								
D:Conscientiousness	8.5	-.291**	n/a	0	n/a	n/a	n/a	n/a
E:Conscientiousness & Openness	12.3	-.248** .201**	18.271	7	.975	.946	.095	.038
F:Conscientiousness & Sociability	10.1	-.238** .158*	11.640	12	1.00	1.00	0.001	0.019
Facebook Info								
G: Sociability	11.8	.343**	9.660	5	.995	.990	0.057	0.017
H: Sociability & Need for Cognition	13.8	.332** -1.42*	43.396	18	.979	.968	0.070	0.031
I: Sociability & Need for Cognition & Age	15.8	.335** -.119* -.145*	47.053	23	.981	.970	.060	.028
Facebook Social								
I: Sociability	2.4	.156**	3.945	5	1.000	1.000	0.000	0.012
J: Sociability & Neuroticism	4.8	.161** .153*	19.75	18	.998	.998	0.018	0.032
K: Sociability & Neuroticism & Age	9.4	.162** .119* -.219**	22.867	23	1.000	1.000	0.001	0.029

Note: * < .05; ** < .001; All factor indicator loadings are > 0.7

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Table 5

Means (possible range 1-7), Standard Deviations and ANOVA results of personality characteristics among Facebook and Twitter users.

	Facebook (n = 197)		Twitter (n = 103)		<i>F</i>	<i>df</i>	<i>Sig</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Neuroticism	4.025	0.993	3.689	1.124	6.857	298	0.001
Extraversion	4.623	1.027	4.233	1.394	7.459	298	0.001
Openness	4.928	0.808	5.050	1.133	1.149	298	0.285
Agreeableness	5.074	0.815	5.000	0.838	0.538	298	0.464
Conscientiousness	4.871	0.953	5.065	0.959	2.709	298	0.101
NFC	5.049	0.944	5.597	0.865	23.303	298	0.001
Sociability	4.989	0.822	4.399	1.192	24.914	298	0.001