



## Research Report

## Individual differences predicting social connectedness derived from Facebook: Some unexpected findings



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## ARTICLE INFO

## Article history:

Available online 22 May 2015

## Keywords:

Facebook  
 Facebook social connectedness  
 Facebook attitudes  
 Five factor model  
 Emotional stability  
 Social networking sites

## ABSTRACT

Social connectedness derived from Facebook is associated with positive outcomes such as better psychological health wellbeing. Yet to date, little is known about the construct of Facebook social connectedness. The aim of this study was to draw on existing studies of Facebook use to investigate what might predict social connectedness stemming from Facebook use. Participants ( $N = 326$ , age range 18–78 years) provided demographic information and completed measures of Facebook use, attitudes towards Facebook, personality, and Facebook social connectedness. It was hypothesised that younger age, positive attitudes, extraversion and openness to experience would predict Facebook social connectedness. Interestingly, with only age and attitude in the model, being older and having more favourable attitudes to Facebook predicted social connectedness derived from Facebook, with age acting as a suppressor variable. With the addition of personality in the final model, favourable attitudes to Facebook, extraversion, and openness to experience predicted Facebook social connectedness. In contrast to predictions, emotional stability also contributed significantly to the model. Findings are discussed in terms of implications for the social connectedness of older adults, and the role of emotional stability in the generation of social capital and in the “social enhancement” hypothesis.

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## 1. Introduction

In recent times, there has been a rapid increase in the use of online social networking sites, such as Facebook (Nadkarni & Hofmann, 2012). Facebook now ranks consistently as the first or second most visited website in the world (Alexa, 2015). Much research has considered motivations for Facebook use (e.g., Aladwani, 2014), and has explored the negative outcomes associated with Facebook use (e.g., Sagioglou & Greitemeyer, 2014). However, in addition, a positive psychology approach to Facebook has emerged, with the use of Facebook as a source of social connectedness (Grieve, Indian, Witteveen, Tolan, & Marrington, 2013) and social support (Indian & Grieve, 2014; Nabi, Prestin, & So, 2013) now considered. The aim of this research was to provide the first examination of the role of individual differences in predicting social connectedness derived online.

Social connectedness refers to the feelings of belongingness and affiliation that emerge from interpersonal relationships within

social networks (e.g. Lee, Draper, & Lee, 2001). While a broad range of extant research has shown that face-to-face social networks and connectedness are associated with positive psychological outcomes, such as improved well-being (e.g., Cockshaw & Shochet, 2010; Lee et al., 2001), Grieve et al. (2013) extended the examination of social connectedness to consider social connectedness derived specifically from Facebook. Grieve et al.'s study revealed that Facebook social connectedness also comprised feelings of belongingness and affiliation, but from the online— rather than traditional— social network. Further, Grieve et al. found that Facebook social connectedness was related to, but distinct from, social connectedness obtained from face-to-face social networks. In addition, higher levels of Facebook social connectedness were associated with less depression, anxiety, and stress, and greater levels of subjective well-being. Grieve et al. concluded that Facebook could act as an alternative medium for social connectedness, and, given its association with positive psychological outcomes, that further consideration of the construct of Facebook social connectedness was necessary. However, to date, there is no extant research that has investigated the user characteristics that might predict social connectedness derived from Facebook.

Nonetheless, there is existing research regarding Facebook use that may provide insight into likely variables of interest. For example, social networking sites are predominantly considered to be a

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medium for the young (Livingstone, 2008; Spies Shapiro & Margolin, 2014), and adolescents report using Facebook to maintain a sense of union with others (Davis, 2012). It would seem then, that age might be a useful predictor of social connectedness derived from Facebook. Further, because favourable attitudes to online interactions predict intentions to engage in online behaviours (Grieve & Elliott, 2013; Moss, O'Connor, & White, 2010), it also seems prudent to investigate whether positive attitudes towards Facebook might predict Facebook social connectedness.

In addition, there is evidence that personality predicts Facebook use, with Ross et al. (2009) finding that greater levels of extraversion (characterised by high sociability) and openness to experience (characterised by intellectual curiosity and openness) were associated with greater use of Facebook. Presumably, higher levels of Facebook use provide increased opportunity to experience social connectedness in that forum. However, it also seems likely that sociable individuals might be predisposed to experiencing social connection, and that those open to less traditional ways of thinking might be more amenable to an alternative form of social connectivity. It follows that extraversion and openness to experience might predict social connectedness resulting from Facebook use.

The aim of this research was therefore to provide a preliminary investigation into the role of chronological age, attitudes towards Facebook, and personality in predicting perceptions of Facebook derived social connectedness. It was hypothesised that younger people and people with more favourable attitudes to Facebook would experience greater levels of social connectedness on Facebook. It was also predicted that extraversion and openness to experience would be positively related to levels of Facebook social connectedness. For completeness, we also assessed the contribution of the other personality dimensions of the Big Five: agreeableness, conscientiousness, and emotional stability.

We tested these predictions using a hierarchical regression model, with age and attitudes entered together, followed by the personality variables. This approach was used so that the contribution of personality to Facebook social connectedness could be examined over and above the two variables we expected to have the strongest effects: age and attitudes.

## 2. Materials and methods

### 2.1. Participants

Facebook users ( $N = 326$ ) were recruited via research invitations on Facebook from a "Facebook Research" profile page generated by the research team. On average, participants were 28.00 years old ( $SD = 10.96$  years, range 18–78 years). The sample was predominantly female (81%). The only selection criteria were that participants had to be adults and users of Facebook.

### 2.2. Measures

#### 2.2.1. Demographic information

A brief demographic section requested that participants report their chronological age, gender, number of Facebook friends, and Facebook use.

#### 2.2.2. Facebook attitudes

Attitude towards Facebook was measured using six items taken from Ellison, Steinfield, and Lampe's (2007) Facebook Intensity Scale. A sample question is "I am proud to tell people I'm on Facebook". Answers are given on a five-point Likert scale with the anchors 1 = *strongly disagree*, and 5 = *strongly agree*. Thus, higher scores indicate more positive attitudes towards Facebook.

Internal reliability (assessed using Cronbach's alpha) was excellent at  $\alpha = .90$  in the current sample.

#### 2.2.3. Facebook social connectedness

Social connectedness derived from the use of Facebook was using the 13-item Facebook Social Connectedness scale presented by Grieve et al. (2013). Participants respond to items such as "I feel close to people on Facebook" and "I find myself actively involved in Facebook friends' lives" using a six-point Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Negatively worded items are reverse-scored such that higher scores reflect greater perceptions of Facebook social connectedness. Reliability in the current sample was excellent ( $\alpha = .91$ ).

#### 2.2.4. Personality

We used the Ten-Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003) to assess the Big Five domains of personality: extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience. Participants endorse their level of agreement (on a seven-point scale where 1 = *strongly disagree* and 7 = *strongly agree*) to pairs of traits presented in each of the 10 items. Five items are reverse-scored, and higher scores indicate higher levels of each personality domain.

### 2.3. Design and procedure

Data were collected cross-sectionally, using a correlational design. The predictor variables were age, attitudes to Facebook, and extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience. The outcome variable was Facebook social connectedness.

After ethical clearance was obtained from the University's ethics committee, participants were invited to take part in an online survey investigating Facebook use via postings on Facebook. After giving informed consent, participants completed the questions, before being thanked for their time.

## 3. Results

The number of Facebook friends reported by the sample is presented in Table 1. Table 2 shows the average length of time spent on Facebook per day.

Descriptive statistics for the measures as are reported in Table 3. Means and standard deviations for all measures were in line with previous research (Ellison et al., 2007; Grieve et al., 2013; Saslow, Muise, Impett, & Dubin, 2013).

As the sample was predominantly female, we entered gender into the first step of a hierarchical multiple regression to act as a control variable, also allowing us to establish whether there were any systematic effects of gender on Facebook social connectedness. No significant effect was evident,  $R = .09$ ,  $F(1, 324) = 2.69$ ,  $p = .11$ ,

**Table 1**  
Number of Facebook friends.

Number of friends	Percentage of sample
10 or fewer	0.9
11–50	6.7
51–100	9.2
101–150	14.1
151–200	9.8
201–250	14.1
251–300	9.5
301–400	12.3
400 or more	23.3

**Table 2**

Time spent on Facebook (per day) over the past week.

Time	Percentage of sample
Less than 10 min	9.8
10–30 min	22.7
31–60 min	18.1
1–2 h	20.6
2–3 h	15.0
More than 3 h	13.8

**Table 3**

Mean ratings of attitudes, Facebook connectedness, and personality.

	Mean	Std. deviation
Facebook attitudes	20.71	6.40
Facebook connectedness	52.87	11.35
Extraversion	8.79	3.29
Agreeableness	9.21	2.51
Conscientiousness	9.15	2.65
Emotional stability	9.57	3.12
Openness to experience	10.47	2.34

$f^2 = .008$ , with gender accounting for 0.8% of variance in social connectedness, an extremely small effect (Cohen, 1992).

In the second step, age and Facebook attitude were added, and explained a significant amount of additional variance (23.6%),  $RsquareChange = .23$ ,  $FChange(2,322) = 47.88$ ,  $p < .001$ , with the model also significant,  $R = .49$ ,  $F(3,322) = 33.08$ ,  $p < .001$ ,  $f^2 = .31$ . This was a large effect, explaining 23.6% of the variance in Facebook social connectedness. Both age and attitude were significant individual predictors. Greater age and more positive attitudes significantly predicted Facebook social connectedness. In the final step, the personality variables were added. This significantly improved the model,  $RsquareChange = .12$ ,  $FChange(5,317) = 11.29$ ,  $p < .001$ . The final model explained 35.1% of variance in Facebook social connectedness, which was significant,  $R = .59$ ,  $F(8,317) = 21.44$ ,  $p < .001$ , with a very large effect size,  $f^2 = .54$ . Within the final model, more positive attitudes, higher extraversion and greater emotional stability and openness to experience significantly predicted increased Facebook social connectedness. Bivariate correlations and the hierarchical multiple regression are reported in Tables 4 and 5, respectively.

#### 4. Discussion

This study aimed to identify characteristics that facilitate the experience of social connectedness when using Facebook. The hypotheses were partially supported. In contrast to predictions, in the final model, there was no association between chronological age and reported levels of Facebook social connectedness. This is an interesting finding, given the view that online social networking is predominantly a purview of the young (Spies Shapiro & Margolin, 2014). In fact, with only age and attitude in the model, being older was significant predictor of Facebook derived social connectedness. Moreover, as age had a low correlation with Facebook social connectedness at the bivariate level ( $r = .004$ , see Table 3), this suggests that age is acting as a suppressor variable in the model, contributing to the prediction of Facebook social connectedness by controlling for extraneous variance in the other variables.<sup>1</sup>

<sup>1</sup> Based on the suggestion of an anonymous reviewer, we also considered whether this suppression effect might be an artefact of curvilinear or moderating relationships. Inspection of the relevant scatterplot suggested no curvilinear association, and a moderation analysis conducted in PROCESS revealed no significant interaction effects,  $p = .508$ .

This unexpected finding regarding the age–Facebook social connectedness relationship potentially has important implications. Grieve et al. (2013, see also Indian & Grieve, 2014) suggested that Facebook might provide an alternative medium in which isolated individuals might obtain feelings of social connectedness. Specifically, the current results suggest that there may be particular scope for adults of all ages to engage with others using the online environment, and to obtain bonding social capital from those environments.

Our results also support socioemotional selectivity theory, which suggests that as individuals age, their focus turns to their current social relationships and emotional engagement, rather than having a future orientation in terms of goals and development (Carstensen, Isaacowitz, & Charles, 1999). Within the current context, it seems that the effect seen in our data might reflect an age-based shift from bridging social capital towards bonding social capital in later years. We recommend the use of a cross-sequential design in the future in order to investigate this possibility.

Importantly, existing research has found that in older people, a number of distinctive types of social network can exist, and that engagement with these networks is differentially related to improved well-being (Golden et al., 2009; Litwin & Shiovitz-Ezra, 2011), less depression (Golden et al., 2009), and reduced cognitive decline (Fratiglioni, Pallard-Borg, & Winblad, 2004). For this reason, further investigation of Internet mediated social networks in older populations may also be valuable. Future research could aim to explore this by targeting older Facebook users, and investigating the psychological outcomes associated with Facebook use in this population. Given the consequences of low levels of social capital in older populations, investigating barriers to use of social networking sites across the lifespan is also warranted. Specifically, reducing barriers to online forms of social networking could help to smooth access to alternative forms of bonding social capital in what can be a somewhat isolated population.

As anticipated, more positive attitudes towards Facebook were associated with greater experiences of Facebook social connectedness. This is consistent with existing research that favourable attitudes can predict the intention to take part in online activity (e.g., Grieve & Elliott, 2013; Moss, O'Connor, & White, 2010), and serves as an extension of prior findings by showing that positive attitudes are also related to the psychological experience of connectedness in the online environment.

While generally it is considered that attitudes serve as a precedent to behaviours (e.g. Elliott & Thomson, 2010), it should also be noted that the relationship in this case may be more complex. For example, it is possible that the experience of feeling social connectedness on Facebook, and the positive outcomes associated with that connectedness (see Grieve et al., 2013) are the factors enhancing attitudes towards the site. Given that the need to belong is considered one of the primary drivers behind Facebook use (Nadkarni & Hofmann, 2012), it would be remiss not to take a more nuanced approach when drawing conclusions regarding possible causality. Indeed, the interface between attitudes towards Facebook and social connectedness derived from Facebook may be reciprocal and perhaps cumulative.

As hypothesised, higher levels of extraversion and openness to experience were also linked to greater Facebook social connectedness. Thus, it would seem that individuals who are more outgoing and less conventional are more likely to experience social connectedness within this online social network, reflecting the sociable and flexible thinking within these individuals.

Unexpectedly, however, greater levels of emotional stability were also associated with Facebook social connectedness. This finding may relate to the nature of social capital. It is traditionally suggested that social capital is bidirectional in nature, with individuals not only receiving, but also contributing to experiences of

**Table 4**  
Bivariate correlations.

	Facebook connectedness	Gender	Age	Facebook attitude	Extraversion	Agreeableness	Conscientiousness	Emotional stability	Openness to experience
Facebook connectedness	1.00	.091	.004	.467***	.337***	.007	.053	.157**	.144**
Gender		1.00	-.044	.191***	.109 <sup>†</sup>	-.009	-.022	-.213***	.038
Age			1.00	-.266***	.070 <sup>†</sup>	-.042	-.014	.251***	.095 <sup>†</sup>
Facebook attitude				1.00	.101 <sup>†</sup>	.010	-.068	-.148**	-.058
Extraversion					1.00	-.055	.067	.184***	.201***
Agreeableness						1.00	.341***	.172**	-.154**
Conscientiousness							1.00	.171**	-.040
Emotional stability								1.00	.131**
Openness to experience									1.00

Gender dummy coded as 1 = male and 2 = female.

<sup>†</sup>  $p < .05$ ,

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

**Table 5**  
Age, attitudes and personality as predictors of Facebook connectedness.

	B	Std. error	Beta	<i>t</i>	<i>p</i> value
Step 1					
Constant	47.921	3.077		15.573	<.001
Gender	2.71	16.51	.091	1.64	.102
Step 2					
Constant	32.793	3.186		10.292	<.001
Gender	.017	1.481	.001	.011	.991
Age	.142	.052	.138	2.722	.007
Facebook attitude	.892	.091	.503	9.755	<.001
Step 3					
Constant	15.239	4.556		3.345	.001
Gender	.134	1.418	.005	.095	.925
Age	.072	.050	.070	1.434	.153
Facebook attitude	.880	.086	.497	10.246	<.001
Extraversion	.767	.166	.223	4.611	<.001
Agreeableness	-.225	.226	-.050	-.995	.321
Conscientiousness	.288	.211	.067	1.369	.172
Emotional stability	.564	.183	.155	3.085	.002
Openness to experience	.538	.231	.111	2.333	.020

Note. Gender dummy coded as 1 = male and 2 = female.

belongingness (e.g., Granovetter, 1973). It seems possible that more emotionally stable individuals are better positioned to contribute social capital (due to their relatively better stress tolerance and lower emotional reactivity), but that they are also more likely to have social capital provided to them. This idea of mutual bonding would align with Thoits' (2011) suggestion that everyday social interactions have the capacity to support "a sense of mattering to others" (p. 150).

The relationship between emotional stability and Facebook connectedness seen here might also provide additional insight into the 'social enhancement' hypothesis. This hypothesis holds that extraverted individuals use the online environment to enhance their existing social networks (e.g., Valkenburg, Schouten, & Peter, 2005; Zywicki & Danowski, 2008). The current results might seem to suggest a similar pattern for emotionally stable individuals, with Facebook serving as an additional social medium in which to connect and engage with others. If so, this suggests that the role of popularity and sociability within the social enhancement hypothesis might be better framed to extend beyond extraversion and self-esteem.

#### 4.1. Limitations and additional considerations

The cross-sectional nature of this study means that it is difficult to infer causation, thus longitudinal consideration of some of the

mechanisms proposed here is warranted. Nonetheless, the direction of proposed relationships seems logical given their theoretical bases. Future longitudinal research could seek to address this empirically using a prospective design. It should also be noted that although gender was controlled for in the analyses, the sample was comprised predominantly of females, suggesting that caution should be taken in generalising the results to the overall population.

Additionally, this study examined the correlates of social connectedness derived online from one social networking site only. While the characteristics of Facebook (meeting both belongingness and self-presentation needs; Nadkarni & Hofmann, 2012) make it ideally suited as a source of social connectedness, it is feasible that other social networking sites (such as Twitter or Instagram) might also allow provision of some aspects of social connectedness. If so, it remains to be seen whether the predictors of social connectedness derived from other social networking sites differ from the ones revealed here. Future research could investigate this possibility.

Further, if researchers intend to extend this research in a Facebook-specific context, it will be important to be mindful of the evolving nature of Facebook. As such, it would also be prudent for future researchers to consider additional emerging measures of Facebook use, or perhaps to use a qualitative approach.

## 5. Summary and conclusion

Facebook social connectedness is associated with improved psychological health and wellbeing (Grieve et al., 2013). This research examined the predictors of social connectedness derived from Facebook. Findings suggest that attention to the role of chronological age, attitudes towards Facebook, and personality is indicated when considering how people experience belongingness using this particular social network. Given the increasingly ubiquitous nature of digital social networks, the current findings provide insight into the factors which determine who can best derive social benefits online.

### Author disclosure statement

No competing financial interests exist.

### References

- Aladwani, A. M. (2014). Gravitating towards Facebook (GoToFB): What is it? and how can it be measured? *Computers in Human Behavior*, 33, 270–278.
- Alexa (2015). Top Sites. Retrieved 24th February 2015 from <<http://www.alexa.com/siteinfo/facebook.com>>.

- Carstensen, L. L., Isaacowitz, D. M., & Charles, S. T. (1999). Taking time seriously: A theory of socioemotional selectivity. *American Psychologist*, 54, 165–181.
- Cockshaw, W. D., & Shochet, I. M. (2010). The link between belongingness and depressive symptoms: An exploration in the workplace interpersonal context. *Australian Psychologist*, 45(4), 283–289.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112, 155–159.
- Davis, K. (2012). Friendship 2.0: Adolescents' experiences of belonging and self-disclosure online. *Journal of Adolescence*, 35(6), 1527–1536.
- Elliott, M. A., & Thomson, J. A. (2010). The social cognitive determinants of offending drivers' speeding behaviour. *Accident Analysis and Prevention*, 42, 1595–1605.
- Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends:" Social capital and college students use of online social network sites. *Journal of Computer-Mediated Communication*, 12, 1143–1168.
- Fratiglioni, L., Pallard-Borg, S., & Winblad, B. (2004). An active and socially integrated lifestyle in late life might protect against dementia. *Lancet Neurology*, 3, 343–353.
- Golden, J., Conroy, R. M., Bruce, I., Denihan, A., Greene, E., Kirby, M., et al. (2009). Loneliness, social support networks, mood and wellbeing in community-dwelling elderly. *International Journal of Geriatric Psychiatry*, 24, 694–700.
- Gosling, S. D., Rentfrow, P. J., & Swann, W. B. (2003). A very brief measure of the Big Five personality domains. *Journal of Research in Personality*, 37, 504–528.
- Granovetter, M. S. (1973). The strength of weak ties. *American Journal of Sociology*, 78(6), 1360–1380.
- Grieve, R., & Elliott, J. (2013). Cyberfaking: I can, so I will? Intentions to fake in online psychological testing. *Cyberpsychology, Behavior, and Social Networking*, 16(5), 364–369.
- Grieve, R., Indian, M., Witteveen, K., Tolan, G. A., & Marrington, J. (2013). Face-to-face or Facebook: Can social connectedness be derived online? *Computers in Human Behaviour*, 29, 604–609.
- Indian, M., & Grieve, R. (2014). When Facebook is easier than face-to-face: Social support derived from Facebook in socially anxious individuals. *Personality and Individual Differences*, 59, 102–106.
- Lee, R. M., Draper, M., & Lee, S. (2001). Social connectedness, dysfunctional interpersonal behaviors, and psychological distress: Testing a mediator model. *Journal of Counselling Psychology*, 48, 310–318.
- Litwin, H., & Shiovitz-Ezra, S. (2011). Social network type and subjective well-being in a national sample of older Americans. *The Gerontologist*, 51(3), 379–388.
- Livingstone, S. (2008). Taking risky opportunities in youthful content creation: Teenagers' use of social networking sites for intimacy, privacy and self expression. *New Media and Society*, 10(3), 393–411.
- Moss, N. D., O'Connor, E. L., & White, K. M. (2010). Psychosocial predictors of the use of enhanced podcasting in student learning. *Computers in Human Behavior*, 26(3), 302–309.
- Nabi, R. L., Prestin, A., & So, J. (2013). Facebook friends with (health) benefits? Exploring social network site use and perceptions of social support, stress, and well-being. *Cyberpsychology, Behaviour, and Social Networking*, 16(10), 721–727.
- Nadkarni, A., & Hofmann, S. G. (2012). Why do people use Facebook? *Personality and Individual Differences*, 52, 243–249.
- Ross, C., Orr, E. S., Siscic, M., Arseneault, J. M., Simmering, M. G., & Orr, R. R. (2009). Personality and motivations associated with Facebook use. *Computers in Human Behavior*, 25, 578–586.
- Sagioglou, C., & Greitemeyer, T. (2014). Facebook's emotional consequences: Why Facebook causes a decrease in mood and why people still use it. *Computers in Human Behavior*, 35, 359–363.
- Saslow, L. R., Muise, A., Impett, E. A., & Dubin, M. (2013). Can you see how happy we are? Facebook images and relationship satisfaction. *Social Psychological and Personality Science*, 4(4), 411–418.
- Spies Shapiro, L. A., & Margolin, G. (2014). Growing up wired: Social networking sites and adolescent psychosocial development. *Clinical Child and Family Psychology Review*. <http://dx.doi.org/10.1007/s10567-013-0135-1>.
- Thoits, P. A. (2011). Mechanisms linking social ties and support to physical and mental health. *Journal of Health and Social Behaviour*, 52, 145–161.
- Valkenburg, P. M., Schouten, A. P., & Peter, J. (2005). Adolescents' identity experiments on the Internet. *New Media and Society*, 7(3), 383–402.
- Zywica, J., & Danowski, J. (2008). The faces of Facebookers: Investigating social enhancement and social compensation hypotheses; predicting Facebook and offline popularity from sociability and self-esteem, and mapping the meanings of popularity with semantic networks. *Journal of Computer-Mediated Communication*, 14, 1–34.