Computers in Human Behavior 32 (2014) 171–177

Contents lists available at ScienceDirect

Computers in Human Behavior

journal homepage: www.elsevier.com/locate/comphumbeh

The true self online: Personality correlates of preference for self-expression online, and observer ratings of personality online and offline

Tamsin C. Marriott, Tom Buchanan *

University of Westminster, London, United Kingdom

ARTICLE INFO

Article history:
Available online 28 December 2013

Keywords:
Personality
Online
Internet
Real me
True self

ABSTRACT

Theorists have suggested some people find it easier to express their "true selves" online than in person. Among 523 participants in an online study, Shyness was positively associated with online 'Real Me' self location, while Conscientiousness was negatively associated with an online self. Extraversion was indirectly negatively associated with an online self, mediated by Shyness. Neuroticism was positively associated with an online self, partly mediated by Shyness. 107 online and offline friends of participants provided ratings of them. Overall, both primary participants and their observers indicated that offline relationships were closer. However, participants who located their Real Me online reported feeling closer to their online friends than did those locating their real selves offline. To test whether personality is better expressed in online or offline interactions, observers' ratings of participants' personalities were compared. Both online and offline observers' ratings of Extraversion, Agreeableness and Conscientiousness correlated with participants' self-reports. However, only offline observers' ratings of Neuroticism correlated with participants' own. Except for Neuroticism, the similarity of online and offline observers' personality ratings to participants' self-reports did not differ significantly. The study provides no evidence that online self-presentations are more authentic; indeed Neuroticism may be more visibly expressed offline.

1. Introduction

A diverse but substantive theoretical and empirical literature deals with the idea that our identity as individuals may have multiple facets that are expressed or emerge in different contexts. In early work on how people behave in online environments, Turkle (1997) characterised the internet as a laboratory for identity exploration. Some theorists have suggested that we may have a sense of our 'true' self that is distinct from the 'actual' self that we normally present in social interactions, and that interacting on the internet may facilitate its expression (McKenna, 2007).

Bargh, McKenna, and Fitzsimons (2002) define this 'true self' as "those identity-important and phenomenally real aspects of self not often or easily expressed to others" (p. 34). It has been suggested that the internet, as a communication medium and interaction space, facilitates self expression of one's true self in two main ways. It first offers the ability to remain anonymous to (or at least non-identifiable by) dyadic or group interaction partners, and secondly the opportunity to locate interaction partners who share aspects of one's true self.

As a result, Bargh, McKenna, et al. (2002) suggest that at least some people may express their true selves more freely in online than in face-to-face interaction, and furthermore that the strength of this effect may be influenced by personality. Research by McKenna, Green, and Gleason (2002) suggests that people who find communicating face-to-face awkward, such as lonely or socially anxious people, may find it easier to express their true selves online rather than offline. Shyness or social anxiety, which can act as a barrier to relationship formation in the offline world, may become unimportant online. Along similar lines, Scharlott and Christ (1995) argued that more shy individuals, who they describe as having a tendency towards being "tense and inhibited in the presence of others" (p. 196), used a text-based online matchmaking system to overcome their inhibitions about meeting potential partners. Thus, we might predict that the shy or socially awkward would have a preference for online self-expression. Conversely, those who are more comfortable in face-to-face interactions may not show such a tendency.

This position has been supported by the limited amount of existing research on this issue. A small study by Amichai-Hamburger, Wainapel, and Fox (2002) found that introverted and neurotic people reported finding it easier to express their true self online more than offline. Studies by Peter, Valkenburg, and Schouten (2005) and Tosun and Lajunen (2010) found that people

* Corresponding author. Address: University of Westminster, 309 Regent Street, London W1B 2UW, United Kingdom.
E-mail address: buchant@wmin.ac.uk (T. Buchanan).

0747-5632/$ - see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.chb.2013.11.014

who were motivated to use the internet to interact with others to compensate for social difficulties experienced in face-to-face interactions disclosed more about themselves online and made more online friends. Tosun and Lajunen (2010) also found the traits of Neuroticism and Psychoticism to be positively associated with expressing one's true self on the internet. However, existing research on the personality correlates of a preference for self-expression online versus offline is relatively scarce, and only addresses a limited number of personality traits.

The current dominant model for describing personality is the Five Factor Model (also known as 'the Big Five'). This describes five major dimensions of personality: Extraversion, Openness to Experience, Agreeableness, Conscientiousness, and Neuroticism/emotional stability (Costa and MacCrae, 1992; Goldberg, 1990). Extraversion reflects our tendency to seek out the company of others and behave in an energetic manner in social situations. Openness to Experience reflects interest in culture, abstract thought, creativity and educational experiences. Agreeableness reflects how we interact with others, with high scorers being more trusting, friendly and cooperative. Conscientiousness reflects our degree of organization, reliability and persistence in pursuit of our goals. Neuroticism (low emotional stability) reflects the tendency to experience negative thoughts and feelings; insecurity and emotional distress. The current study aimed to examine the full range of Five Factor Model personality dimensions, in addition to other factors that may be related to a self-reported preference for expressing one's true self online.

Aspects of personality and identity are expressed through behaviour such that they are observable by others. There is a large body of work that compares observers' assessments of an individual's personality with self-ratings of personality. Two recent meta-analyses of such research found that, overall, Extraversion, Openness to Experience, and Conscientiousness elicited ratings that were most similar to self-ratings, while the levels of a person's Agreeableness and Neuroticism seemed to be somewhat harder to gauge accurately (Connelly & Ones, 2010; Connolly, Kavanagh, & Viswesvaran, 2007).

Several studies have also explored the assessment of personality by examination of computer-mediated communications (CMC), such as emails (Gill, Oberlander, & Austin, 2006), personal web pages (Marcus, Machilek, & Schutz, 2006) and Facebook profiles (Back et al., 2010). These have found similar results to those based on observed behaviour and face-to-face communication, namely that people could rate the Extraversion and Openness levels of targets with reasonable accuracy, but no such evidence for Neuroticism. In contrast, others have found little or no convergence between observer ratings of personality and self-ratings on the basis of an instant messaging conversation and a web-chat (Rouse & Haas, 2003), or interactions via video-conferencing (Okdie, Guadagno, Bernieri, Geers, & Mclarney-Vesotski, 2011).

Most of these studies exploring personality assessment via CMC involved participants rating strangers on the basis of restricted examples of communication on a single occasion (so-called 'thin slices' of behaviour). Research has shown that online interactions can and do lead to close and enduring online friendships (McKenna et al., 2002). However, it is likely that internet-facilitated expression of the true self is something that happens over a period of time and a series of electronic encounters, in the same way as 'getting to know someone' in the offline world is not an instantaneous, one-off event. Thus, a better way of testing whether a person's true self is observable online is to make use of participants with some degree of online interaction history. For this study we therefore sought to obtain personality ratings of participants from 'online friends' as well as from friends they interact with offline.

The present study is based on the notion that we have both a true self and an 'actual self' that we tend to present to others (Bargh, McKenna, et al., 2002), and on research suggesting that the internet may facilitate at least some people to express their true self to online friends more than to offline friends (Amichai-Hamburger et al., 2002; McKenna et al., 2002). We aimed to explore whether any personality traits or other factors, such as levels of Shyness, predict whether someone finds it easier to express their true self online rather than offline. Based on past research evidence, we expected to find that individuals scoring lower on Extraversion (Hypothesis 1), higher on Neuroticism (Hypothesis 2), and higher on Shyness (Hypothesis 3) would have a preference for expressing their true self online. Finally, the present study aimed to explore whether people express themselves more authentically online or offline. This was done by comparing personality ratings made by people who knew participants primarily online or offline with participants' own personality ratings.

2. Material and methods

2.1. Participants

Two sorts of participant took part in the study: primary participants, and observers invited by the primary participants to answer questions about them. Primary participants ($n = 523$) were recruited from a variety of sources, including via an established personality testing website (www.personalitytest.org.uk), notices placed on several websites hosting psychological research projects, postings on various online discussion boards or forums (e.g. Digital Spy, friendships forums, Mumsnet, the Student Room), and through contacts on Facebook and Twitter. Two companies providing panels of paid participants were also contracted, and first year undergraduate university students on a psychology degree course were recruited in return for course credits.

Responses were received from 258 observers nominated by primary participants, who were linked to primary participants by identification numbers passed onto them by primary participants. One hundred and eighteen were unusable due to missing or incorrect participant ID numbers, incomplete data or no consent given to use data, or where the main participant had not given consent. These were excluded, leaving useable responses from 140 observers. Participants were given the opportunity to nominate more than one online and offline friend, but where more than one of each type of observer responded, only their first online and offline friends' data were used in the analyses. This amounted to 41 online friends and 66 offline friends. Of these, 25 participants had at least one online and one offline friend.

Primary participants were 62% female and 37% male, with 5 participants (1%) declining to give their gender. They ranged in age from 16 to 75; 21% were in the 16–20 age group and a further 27% were aged 30 or under. US residents comprised 69% of the sample, 27% were from the UK, and the remaining 4% came from 15 other countries. 47% were employed or self-employed, and 30% were students. Reflecting the large proportion of students, 58% of participants reported either having some university education or having graduated from university.

Of the 41 online observers, 22 were female and 19 were male, 61% were aged 25 or under, 51% were from the UK and 32% from the US, 32% were employed or self-employed and 44% were students. Of the 66 offline observers, 49 were female and 16 were male, 60% were aged 25 or under, 62% were from the UK and 29% from the US, 48% were employed or self-employed and 42% were students.

2.2. Materials

2.2.1. Personality

A 41-item Five-Factor inventory, validated for use on the internet (Buchanan, Johnson, & Goldberg, 2005), was used by

respondents to report their levels of Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience. In this inventory, Extraversion is assessed by 9 items such as "*Am skilled in handling social situations*" (Buchanan et al., 2005, report alpha reliability of .88). Agreeableness is assessed by 7 items such as *"Have a good word for everyone"* (alpha = .76). Conscientiousness is assessed by 10 items such as *"Pay attention to details"* (alpha = .84). Neuroticism is assessed by 8 items such as "*Have frequent mood swings*" (alpha = .83). Openness to Experience is assessed by 7 items such as "*Believe in the importance of art*" (alpha = .74). Participants were asked to rate the accuracy of statements about their typical or general behaviour on a 5-point scale ranging from 1 "*very inaccurate*" to 5 "*very accurate*".

2.2.2. Shyness

Participants were asked all four questions from the Shyness scale used by Scharlott and Christ (1995): "*I feel tense when I am with people I don't know very well*"; "*When I am in a group of people, I have trouble thinking of the right things to talk about*"; "*I am often uncomfortable at parties and other social functions*"; and "*It is hard for me to act natural when I am meeting new people*". Responses were made on a 5-point scale ranging from 1 "*strongly disagree*" to 5 "*strongly agree*". This measure has previously been used online with findings that suggest it is a reliable measure in that format (Whitty & Buchanan, 2009, report alpha = .89).

2.2.3. True self online

Participants completed a version of McKenna et al.'s (2002) 'Real Me' scale (Bargh, Fitzsimons, et al., 2002). This measured where they felt more able to express their true selves, online or offline, with items such as "*To what extent would your family and friends be surprised if they read your email and/or newsgroup postings?*". The scale consisted of five items; the first two items elicit a categorical yes/no response, and the next 3 items require responses on a 7-point scale with higher values representing preferences for self-expression online, and lower values preferences for self-expression offline. Evidence for construct validity of this measure comes from McKenna et al.'s (2002) findings that participants' tendencies to report their 'Real Me' as located more online were positively correlated with a large number of behaviours involved in online relationship formation.

2.2.4. Friends

Participants were asked how long they had known their nominated online and offline friends (1 = *less than 3 months*, 2 = *3–12 months*, 3 = *1–5 years*, 4 = *over 5 years*), how often they interacted (1 = *every day*, 2 = *once a week*, 3 = *once a month*, 4 = *every few months*, 5 = *once a year or less*), how close they felt to their friend, on a 7-point scale ranging from 1 "*not close at all*" to 7 "*extremely close*", and a question about the average time they use the internet for each week.

2.3. Procedure

All questionnaires were completed online, using web-based questionnaires. Primary participants initially saw information about the study and completed the Five Factor personality questionnaire. After completing this 41-item personality measure, and receiving brief feedback on their scores, participants were asked to invite two other people they knew to rate their personality. They were requested to ask two different types of informant to provide ratings of them: people who knew them in 'real life' ('offline friends'), and 'online friends' – people whom they met and have mainly communicated with electronically (e.g. on a dating site, in a chat room, via a social networking site, game site, bulletin board/newsgroup). Participants had the choice of either sending an automated email invitation to their friends, or to copy and paste the text of the invitation into a message they could send via their preferred means (e.g. social networking site or other medium). The invitation message provided a link to take observers to another survey, and the participant's unique ID code, so that we could link observers to primary participants.

Observers followed links from the invitation messages primary participants sent them, taking them to information and informed consent pages. They then completed the same 41-item personality measure completed by the primary participants, but were asked to complete it with reference to the friend who had nominated them. They were also asked the same questions about their friendship with the primary participant that the primary participant had been asked.

3. Results

3.1. True self online

Responses to the personality and Shyness scales were scored in the standard manner to give indices of Extraversion, Agreeableness, Conscientiousness, Neuroticism, Openness to Experience and Shyness. Responses to the Real Me measure were scored in two ways. Conversion of responses to *z* scores allowed a total score on a continuous scale to be calculated, while scoring according to Bargh, Fitzsimons, et al. (2002) resulted in grouping of respondents into one of three categories: those who were more able to express themselves online (Onliners), those better able to express themselves offline (Offliners) and those without a clear inclination either way (Tweeners). This resulted in 42 participants being categorised as Onliners, 125 being categorised as Offliners, and 350 as Tweeners.

Table 1 shows the descriptive statistics and reliability coefficients (Cronbach's alpha) of the measures completed by the participants (personality scales, Real Me and Shyness) and the observers (personality scales).

The Cronbach's alpha reliability coefficients for participants' self-reported personality ratings were lower than ideal, but were considered high enough (all over .65) for most of the scales to be usable for exploratory purposes. However, the reliability coefficients of observer ratings of Openness were particularly weak (.57 and .43). This suggested the trait could not be reliably reported by observers, and it was accordingly excluded from analyses.

We examined relationships between participants' scores on Extraversion, Agreeableness, Conscientiousness and Neuroticism (leaving out Openness because of low reliability), the Shyness scale, their self-reported internet use and the extent to which they report feeling more comfortable disclosing their 'real selves' online or offline. For the Real Me measure, the *z* scores were used order to give data on a continuous scale. Table 2 shows the correlations.

Consistent with Hypothesis 1, Extraversion was negatively correlated with tendencies to locate the Real Me online. Similarly, Agreeableness and Conscientiousness also had significant negative relationships with Real Me scores; indicating that high scores on all three of these personality domains were associated with a more offline location of the Real Me. As predicted by Hypotheses 2 and 3, Neuroticism and Shyness were significantly positively related to Real Me scores. The same was true of higher levels of internet use. The strongest relationships observed for Real Me scores were with Shyness, low Conscientiousness and Neuroticism (r = .26, −.25, and .22 respectively).

Shyness was itself negatively related to Extraversion, Agreeableness and Conscientiousness, and positively related to Neuroticism. Low Extraversion and Neuroticism were both particularly highly correlated with Shyness (r = −.65 and r = .41 respectively)

Table 1
Descriptive statistics and Cronbach's alpha for personality scales, Real Me *z* scores and Shyness scale.

Trait	Self-rating				Online observer rating				Offline observer rating			
	n	*M*	*SD*	α	*n*	*M*	*SD*	α	*n*	*M*	*SD*	α
Extraversion	523	29.0	6.59	.69	39	32.9	6.22	.83	66	32.8	5.20	.73
Agreeableness	523	27.2	4.30	.66	39	28.6	3.69	.68	63	28.1	5.22	.84
Conscientiousness	523	35.6	6.71	.77	41	35.9	7.27	.87	66	37.7	7.18	.86
Neuroticism	523	21.2	6.44	.74	40	20.0	4.91	.69	66	19.6	5.25	.73
Openness	523	24.2	4.90	.65	39	24.9	3.99	.57	66	24.1	3.41	.43
Real Me *z*	506	0.0	3.88	.84								
Shyness	515	11.6	4.26	.89								

Table 2
Relationships among primary participants' scores for Extraversion, Agreeableness, Conscientiousness, Neuroticism, Real Me z scores, Shyness and internet use.

Trait	Agreeableness		Conscientiousness		Neuroticism		Real Me *z*		Shyness		Internet Use	
	r	*n*	*r*	*n*	*r*	*n*	*r*	*n*	*r*	*n*	*r*	*n*
Extraversion	.08	523	.19**	523	−.26**	523	−.16**	506	−.65**	515	−.02	438
Agreeableness			.38**	523	−.36**	523	−.18**	506	−.14**	515	.01	438
Conscientiousness					−.49**	523	−.25**	506	−.23**	515	−.06	438
Neuroticism							.22**	506	.41**	515	.12*	438
Real Me *z*									.26**	504	.16**	432
Shyness											.038	436

* $p < .05$.
** $p < .01$.

indicating that introverted and less emotionally stable participants had higher levels of Shyness. Neuroticism also had a significant positive relationship with internet use, suggesting that less emotionally stable individuals spent more time using the internet.

In order to establish which of these variables were the strongest predictors of Real Me online, a standard multiple regression was conducted, with Shyness, Neuroticism, Extraversion, Conscientiousness and Agreeableness being entered as predictors. Internet use was not entered as a predictor, despite its significant correlation with Real Me online, as there is no theoretical reason to believe that spending more time on the internet leads one to prefer to disclose oneself more authentically online rather than offline. Indeed the causality might be in the other direction – i.e. that finding it easier to be one's 'real self' online leads one to spend more time online.

The overall model was significant ($R^2 = .11$, $F_{(5, 498)} = 12.5$, $p < .001$), but the coefficients of the individual predictors revealed that only Shyness ($\beta = .22$, $t = 3.67$, $p < .001$) and Conscientiousness ($\beta = -.16$, $t = -3.17$, $p < .001$) were statistically significant predictors.

Given the significant correlations between Neuroticism and Real Me online and between both Extraversion and Neuroticism and Shyness, further analyses were conducted to establish whether Shyness could be mediating the relationship between Extraversion and Neuroticism and Real Me. While Agreeableness and Conscientiousness also correlated with Shyness, the degree of shared variance was an order of magnitude lower than for Extraversion and Neuroticism.

According to the method for establishing mediation set out by Baron and Kenny (1986), a series of regression analyses were conducted. First, the predictors, Extraversion and Neuroticism, were regressed onto the criterion, Real Me. The model ($R^2 = .06$, $F_{(2, 503)} = 15.68$, $p < .001$) showed that both Extraversion ($\beta = -.10$, $t = -2.33$, $p < .05$) and Neuroticism ($\beta = .19$, $t = 4.31$, $p < .001$) were significant predictors of Real Me online. A second regression analysis showed that both predictors Extraversion ($\beta = -.58$, $t = -17.78$, $p < .001$) and Neuroticism ($\beta = .26$, $t = 7.92$, $p < .001$) significantly predicted the presumed mediator, Shyness. Thirdly both predictors (Extraversion and Neuroticism) and the mediator (Shyness) were entered into the regression model and were seen to significantly predict Real Me online ($R^2 = .08$, $F_{(3, 500)} = 14.77$, $p < .001$). Both Shyness ($\beta = .21$, $t = 3.58$, $p < .001$) and Neuroticism ($\beta = .14$, $t = 2.89$, $p < .01$) remained significant predictors, although the contribution of Neuroticism shrank. The contribution of Extraversion shrank almost to zero ($\beta = .02$, $t = .36$, $p = .719$). This suggests that the relationship between Extraversion and Real Me is fully mediated by Shyness, while that between Neuroticism and Real Me is partially mediated by Shyness.

While the classic Baron and Kenny (1986) approach is widely used and easy to understand, it has been criticised on a number of grounds in recent years (e.g. Preacher & Hayes, 2004). The mediation analysis was therefore repeated using the SOBEL SPSS macro described by Preacher and Hayes (2004) for more rigorously testing indirect effects in simple mediation models.

First, the extent to which the relationship between Extraversion and Real Me was indirect (mediated by Shyness) was assessed using the macro. The Sobel test of the indirect effect produced an estimated value of −.10 ($SE = .023$) which was significantly different from zero ($p = .0000$). A bootstrapped estimate of the sampling distribution of the indirect effect, using the methodology described by Preacher and Hayes (2004) and based on 5000 resamples, generated a 99% confidence interval for the indirect effect of −.17 to −.038. Thus, the estimated indirect effect was significantly different from zero ($p < .01$), indicating mediation.

For the extent to which the relationship between Neuroticism and Real Me was indirect (mediated by Shyness), the Sobel test produced an estimate of .049 ($SE = .013$) for the indirect effect which was significantly different from zero ($p = .0001$). A bootstrapped estimate based on 5000 resamples generated a 99% confidence interval for the indirect effect of .015 to .091. The estimated indirect effect was thus significantly different from zero ($p < .01$), again indicating mediation.

These analyses are entirely consistent with the conclusion above: the effects of Extraversion and Neuroticism on Real Me are fully (E) and partially (N) mediated by Shyness.

3.2. Online/offline friendships

Participants and observers were asked about how long they had known their nominated/nominating friends, how often they

interacted, and how close they felt to them. Descriptive statistics for the nature of participants' relationships with their online and offline friends are shown in Table 3.

Results of paired-sample tests of difference between online and offline friendships, as reported by primary participants, revealed that primary participants had known their offline friends significantly longer than online ones, (Wilcoxon $z = -3.13$, $N = 500$, $p = .002$, effect size $r = -.14$), and felt significantly closer to their offline friends than their online ones, $t_{(500)} = -3.44$, $p < .01$, Cohen's $d = .19$. There were no differences in the frequency of interactions with online and offline friends (Wilcoxon $z = -.088$, $N = 504$, $p > .05$, effect size $r = -.0004$).

For primary participants with both online and offline friends, tests on the same friendship factors when reported by observers showed that offline friends felt significantly closer to the participant than online friends ($t_{(23)} = -3.00$, $p < .01$, Cohen's $d = -.25$). Differences in the frequency of interactions and duration of friendship as reported by observers approached but did not reach significance (Wilcoxon $z = -1.91$, $N = 26$, $p = .056$, effect size $r = -.38$ and $z = -1.73$, $N = 26$, $p = .064$, effect size $r = -.34$ respectively).

We examined the data to see whether participants' Real Me score affected how close they felt to their online and offline friends. We expected that those feeling more comfortable with expressing themselves online rather than offline would feel closer to their online friends. Using the categorical RM scores for analysis, independent t-tests showed that Onliners ($M = 4.83$, $SD = 1.41$) felt significantly closer to their online friends than Offliners ($M = 4.26$, $SD = 1.45$) did, $t(161) = 2.18$, $p < .05$, Cohen's $d = 0.41$.

3.3. Similarity of self, online and offline observers' personality ratings

Correlations between self and observer scores on the personality traits (Openness excluded because of low reliability), showed that overall online friends rated E, A and C similarly to participants, while offline friends rated E, A, N and C similarly to participants. The pattern remained the same when closeness of friendship was controlled for. Table 4 shows the correlations.

For the subset of participants with both an online and an offline friend, only E was assessed similarly by their online friends, while offline friends assessed E, A and N similarly. This pattern also remained after controlling for closeness of friendship. Table 5 shows these correlations. While fewer are significant given the smaller sample size, the pattern of correlations is very similar to that in Table 4.

Overall, the mean correlations were higher for offline observers ($M = .5$) than for online observers ($M = .33$). E was the trait most accurately judged by both online and offline friends. Performance of a Williams-Hotelling test to establish whether differences between correlations are significant showed that the only significant difference between the online and offline friends' rating was that for Neuroticism, $t_{(21)} = -2.17$, $p < .05$ (though the difference between ratings on Agreeableness approached significance, $t_{(21)} = -1.94$, $p = .06$). This test is believed to be robust even with small samples (Steiger, 1980).

Finally, Table 6 shows the correlations between personality ratings made by online and offline friends. There is most similarity in ratings of Extraversion (the only significant correlation), with the magnitude of r indicating that the different types of raters agreed with each other as well as the primary participant's self-rating with respect to that trait.

Table 4
Correlations of participants'self-reported personality scores with online and offline observer ratings using full dataset.

Trait	Online			Offline		
	n	r	$r_{partial}$	n	r	$r_{partial}$
Extraversion	39	.63**	.63**	66	.63**	.61**
Agreeableness	39	.46**	.47**	63	.55**	.55**
Conscientiousness	41	.40**	.39*	66	.47**	.48**
Neuroticism	40	.01	.02	65	.50**	.49**

Note: Partial correlations controlled for observer-rated closeness.
* $p < .05$.
** $p < .01$.

Table 5
Correlations of participants' self-reported personality scores and online and offline observer ratings for those with both types of observer.

Trait	Online			Offline		
	n	r	$r_{partial}$	n	r	$r_{partial}$
Extraversion	24	.65**	.68**	24	.70**	.69**
Agreeableness	24	.36	.37	23	.70**	.69**
Conscientiousness	25	.30	.29	24	.40	.39
Neuroticism	25	−.06	−.05	24	.50*	.48*

Note: Partial correlations controlled for observer-rated closeness.
* $p < .05$.
** $p < .01$.

4. Discussion

Consistent with previous research, our results show that individuals who are low in Extraversion (introverted) and those with higher levels of Neuroticism prefer to express their true selves in online rather than in face-to-face interactions. However, the current study found that the role of Extraversion is almost entirely due to its effect on Shyness. Effectively, introverts tend to be more shy in social situations and it is this that leads them to feel more comfortable about expressing themselves openly in online interactions rather than face-to-face.

It is possible that our finding that low Conscientiousness and low Agreeableness also strongly correlated with the preference to express one's true self online could be due to a related effect. Research by Tosun and Lajunen (2010) found that higher levels of Psychoticism predicted a true self online preference, and suggested

Table 3
Mean/median duration, frequency and closeness of primary participants' online and offline friendships.

	Self-reported			Reported by online friends			Reported by offline friends		
	n	Median	M (SD)	n	Median	M (SD)	n	Median	M (SD)
Online friendships									
Duration	516	3		41	3				
Frequency	521	2		41	2				
Closeness	516		4.51 (1.32)	41		5.05 (0.95)			
Offline friendships									
Duration	504	4					67	3	
Frequency	504	2					67	1	
Closeness	505		4.76 (1.27)				64		5.28 (0.88)

Table 6
Correlations between online and offline observers' ratings of the same primary participant.

Trait	*n*	*r*
Extraversion	23	.65**
Agreeableness	22	.40
Conscientiousness	24	.12
Neuroticism	24	.08

* $p < .05$.
** $p < .01$.

that individuals high in Psychoticism are motivated to use the internet for social interactions and for making friends to compensate for difficulties with making and maintaining friendships offline. It has been suggested (Goldberg & Rosolack, 1994) that the trait of Psychoticism, as defined by Eysenck's P–E–N model, is a mixture of low Conscientiousness and low Agreeableness, as measured by Five Factor personality measures. One might speculate, therefore, that our finding that people low in Conscientiousness and Agreeableness prefer to express their true selves online could be because they find online relationships easier to maintain than offline ones. Future research might test this idea specifically.

Extraversion appears to be the trait that is most easily observable, with the highest congruence between self- and other-ratings. With the exception of online observers' assessments of Neuroticism, and the low reliability of both types of observers' ratings of Openness, we found significant positive correlations between self and both types of observer ratings on most of the personality traits. In light of previous research, based both on friends' and strangers' assessments (the latter being on the basis of single-occasion computer-mediated and face-to-face interactions), that found that Neuroticism was hard to gauge accurately (Back et al., 2010; Connelly & Ones, 2010; Gill et al., 2006; Marcus et al., 2006), our finding of a significant difference between online and offline friends in this respect is interesting.

One might speculate that Neuroticism is a trait that may be easier to hide in online interactions than offline ones. Rather than presenting a more authentic version of the self online, people scoring high on Neuroticism may actually be presenting a less authentic version of the self. Those behavioural manifestations of Neuroticism that may make it visible to offline associates (e.g. manifestations of anxiety, somatic complaints, workplace performance) may well not be salient in online interactions. The fact that low emotional stability is not a characteristic valued by society would provide little incentive for people to make an effort to make it more salient. An alternative explanation might lie in the fact that participants had known their offline friends longer and felt closer to them than their online friends. Meta-analyses by Connolly et al. (2007) and Connelly and Ones (2010) found that the accuracy of self-other ratings of Neuroticism were particularly poor for observers who were either strangers or less well-acquainted with the target.

It is not clear why observer ratings of Openness should have been so unreliable, given that previous research found Openness could be rated by others with reasonable accuracy (Back et al., 2010; Connolly et al., 2007; Marcus et al., 2006). It is possible that personal feelings about such topics as art and politics, on which most of the personality measure's items to measure Openness were based, are not subjects that tend to be salient in interactions between participants and their friends, leaving observers with little evidence to inform their ratings. Connelly and Ones (2010) suggested that Openness is a low visibility trait, as it relates to internal thoughts and feelings not usually visible to others.

With respect to the question of whether online or offline friends would have a more accurate impression of participants, we found no significant differences, except for the trait of Neuroticism. Offline friends providing ratings significantly closer to participants own self-reports of Neuroticism than did online friends. Even when the closeness of the friendship was controlled for, this result held true. The answer to our question of whether participants' online friends would know them better than their offline friends was, therefore, that for most traits there was no difference. In most cases both types of observer were equally good at assessing the targets' personality, and if there is any difference it is actually in favour of offline friends.

This implies that our participants did not tend to express themselves more authentically in online contexts, and further suggests that they were not presenting idealized versions of themselves or trying out different identities with their online friends. Our findings also suggest that where there are differences between online and offline friends' ratings, this is likely to be a function of the specific personality characteristic concerned rather than any global or systematic difference arising from method of communication.

One explanation for this may lie in the nature of the online friendships reported by the study's participants and observers. The majority of our participants' online friends (76% as reported by observers) had met the targets on Facebook or a similar social networking site where interactions are observable by people who know them in the real world as well as online. Moreover, almost all online relationships (93% as reported by observers) were conducted in a personally identifiable way. In contrast, most of the research suggesting that the internet facilitates the expression of the true self was based on anonymous and non-identifiable online interactions (Bargh, Fitzsimons, et al., 2002; Bargh, McKenna, et al., 2002; McKenna et al., 2002). Work by McKenna, Buffardi, and Seidman (2005) revealed that the facilitating effect of the internet on the expression of one's true self generally applied only to new acquaintances and not to online interactions with people one already knew offline. Furthermore, when online interactions with a stranger were observed by an offline friend, this inhibited the presentation of the true self. Such an effect would appear to have implications for the expression of the true self in online interactions on social networking sites, such as Facebook, which people tend to use to communicate with people they know offline as well as online, and where interactions are often observable by all their Facebook friends. As most of the online friendships reflected in our study were initiated and conducted on social networking sites, this could explain why we found no difference in how participants presented themselves, whether online or offline.

The fact that 'pure' online relationships were rare was a limitation of the study, as well as perhaps indicating that internet-mediated interaction has evolved beyond the online spaces familiar to theorists working a decade or longer ago. A further limitation lies in the samples it was possible to obtain. While a good number of primary participants was recruited, it proved problematic to recruit sufficient numbers of online and offline observers to provide ratings of them. Only a very small number of participants had both online and offline observers, which impacted both the statistical power and the range of analyses it was possible to perform. With larger samples, it would be instructive to examine whether Real Me location influenced the degree to which online and offline ratings were similar to the participants' own. While this would be a desirable objective for future research, the increased blurring of the boundaries between online and offline relationships would likely make it difficult to achieve.

Of course, not all online spaces are necessarily non-anonymous or merge into our offline worlds. For example, there is regular media coverage of antisocial online behaviour, carried out by individuals who are anonymous to other users of the spaces in which they operate (though not necessarily to the service providers). Our finding that some people report being able to express themselves better online may suggest that for some individuals, in some online

environments, the notion of better expressing the 'Real Me' online may remain valid. Work along the lines of the current study but restricted to such anonymized environments could be of value in testing that hypothesis.

5. Conclusions

The overall finding of this study is that although some people reported being able to express themselves better online than offline, and we found that certain personality traits predicted this, we found little evidence that our participants presented different or more authentic aspects of their selves online. Indeed, it was offline friends who provided ratings of Neuroticism most strongly associated with self-ratings. This is interesting as it suggests that, now that online interactions have become so ubiquitous, and for many, an extension of their social lives in the real world (Correa, Hinsley, & Gil de Zuniga, 2010), people do not actually try out different identities online. Rather, they present much the same version of themselves online as offline. Recent research supports this idea: a study on the accuracy of personality assessments on the basis of Facebook profiles, showed that Facebook profiles seemed to reflect their creators' actual personality rather than their idealized characteristics (Back et al., 2010); and a study by Gosling, Augustine, Vazire, Holtzman, and Gaddis (2011) found that the same personality traits and social processes that were expressed in the offline world were also being expressed in interactions and personal profiles on social networking sites. The authors suggested that social networking sites represent an extension of the offline social world rather than a fundamentally different environment.

There is a strong case to be made that distinctions between online and offline social environments have become blurred. While the internet may still offer some opportunities for anonymous online interactions with like-minded others, which researchers such as Bargh and McKenna claimed facilitated the expression of the true self, this type of interaction may now represent a relatively small proportion of all online interactions. It is therefore possible that the suggestion that the internet *per* se allows the expression of one's "true self" has become outdated. It seems likely that the notion of the internet as an identity laboratory or more accurate looking-glass no longer applies to online social environments in general.

Acknowledgement

The work reported in this paper was supported by contract no. DSTLX1000043811 from the Centre for Defence Enterprise to the second author.

References

Amichai-Hamburger, Y., Wainapel, G., & Fox, S. (2002). "On the internet no one knows I'm an introvert": Extraversion, neuroticism, and internet interaction. *Cyberpsychology and Behavior, 5*(2), 125–128. http://dx.doi.org/10.1089/109493102753770507.

Back, M. D., Stopfer, J. M., Vazire, S., Gaddis, S., Schmukle, S. C., Egloff, B., et al. (2010). Facebook profiles reflect actual personality, not self-idealization. *Psychological Science, 21*(3), 372–374. http://dx.doi.org/10.1177/0956797609360756.

Bargh, J. A., Fitzsimons, G. M., & McKenna, K. Y. A. (2002). The self, online. In S. J. Spencer, S. Fein, M. P. Zanna, & J. M. Olson (Eds.), *Motivated social perception: The Ontario symposium* (pp. 195–213). Mahwah, NJ: Lawrence Erlbaum Associates.

Bargh, J. A., McKenna, K. Y. A., & Fitzsimons, G. M. (2002). Can you see the real me? Activation and expression of the true self on the internet. *Journal of Social Issues, 58*(1), 33–48. http://dx.doi.org/10.1111/1540-4560.00247.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173–1182. http://dx.doi.org/10.1037/0022-3514.51.6.1173.

Buchanan, T., Johnson, J. A., & Goldberg, L. R. (2005). Implementing a five-factor personality inventory for use on the internet. *European Journal of Psychological Assessment, 21*(2), 115–127. http://dx.doi.org/10.1027/1015-5759.21.2.115.

Connelly, B. S., & Ones, D. S. (2010). An other perspective on personality: Meta-analytical integration of observers' accuracy and predictive validity. *Psychological Bulletin, 136*(6), 1092–1122. http://dx.doi.org/10.1037/a0021212.

Connolly, J. J., Kavanagh, E. J., & Viswesvaran, C. (2007). The convergent validity between self and observer ratings of personality: A meta-analytic review. *International Journal of Selection and Assessment, 15*(1), 110–117. http://dx.doi.org/10.1111/j.1468-2389.2007.00371.x.

Correa, T., Hinsley, A. W., & Gil de Zuniga, H. (2010). Who interacts on the Web?: The intersection of users' personality and social media use. *Computers in Human Behavior, 26*(2), 247–253. http://dx.doi.org/10.1016/j.chb.2009.09.003.

Costa, P. T., & MacCrae, R. R. (1992). *Revised NEO personality inventory (NEO PI-R) and NEO five-factor inventory (NEO FFI): Professional manual*. Odessa, FL: Psychological Assessment Resources.

Gill, A. J., Oberlander, J., & Austin, E. (2006). Rating e-mail personality at zero acquaintance. *Personality and Individual Differences, 40*(3), 497–507. http://dx.doi.org/10.1016/j.paid.2005.06.027.

Goldberg, L. R. (1990). An alternative "description of personality": The big-five factor structure. *Journal of Personality and Social Psychology, 59*(6), 1216–1229. http://dx.doi.org/10.1037//0022-3514.59.6.1216.

Goldberg, L. R., & Rosolack, T. (1994). The big five factor structure as an integrative framework: An empirical comparison with Eysenck's P–E–N model. In C. Halverson, F. Kohnstamm, & R. Martin (Eds.), *The developing structure of temperament and personality from infancy to adulthood* (pp. 7–36). Hillsdale, NJ: Lawrence Erlbaum Associates.

Gosling, S. D., Augustine, A. A., Vazire, S., Holtzman, N., & Gaddis, S. (2011). Manifestations of personality in online social networks: Self-reported Facebook behaviors and observable profile information. *Cyberpsychology, Behavior and Social Networking, 14*(9), 483–488. http://dx.doi.org/10.1089/cyber.2010.0087.

Marcus, B., Machilek, F., & Schutz, A. (2006). Personality in cyberspace: Personal web sites as media for personality expressions and impressions. *Journal of Personality and Social Psychology, 90*(6), 1014–1031. http://dx.doi.org/10.1037/0022-3514.90.6.1014.

McKenna, K. Y. A. (2007). Through the Internet looking glass: Expressing and validating the true self. In A. Johnson, K. McKenna, T. Postmes, & U.-D. Reips (Eds.), *The Oxford handbook of internet psychology* (pp. 205–221). Oxford, UK: Oxford University Press.

McKenna, K. Y. A., Buffardi, L., & Seidman, G. (2005). Self-presentation to friends and strangers online. In A. Schutz, K.-H. Renner, & F. Machilek (Eds.), *Internet and personality* (pp. 175–188). Gottingen, Germany: Hogrefe and Huber.

McKenna, K. Y. A., Green, A. S., & Gleason, M. E. J. (2002). Relationship formation on the internet: What's the big attraction? *Journal of Social Issues, 58*(1), 9–31. http://dx.doi.org/10.1111/1540-4560.00246.

Okdie, B. M., Guadagno, R. E., Bernieri, F. J., Geers, A. L., & Mclarney-Vesotski, A. R. (2011). Getting to know you: Face-to-face versus online interactions. *Computers in Human Behavior, 27*(1), 153–159. http://dx.doi.org/10.1016/j.chb.2010.07.017.

Peter, J., Valkenburg, P. M., & Schouten, A. P. (2005). Developing a model of adolescent friendship formation on the internet. *Cyberpsychology and Behavior, 8*(5), 423–430. http://dx.doi.org/10.1089/cpb.2005.8.423.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, and Computers, 36*(4), 717–731. http://dx.doi.org/10.3758/BF03206553.

Rouse, S. V., & Haas, H. A. (2003). Exploring the accuracies and inaccuracies of personality perception following internet-mediated communication. *Journal of Research in Personality, 37*(5), 446–467. http://dx.doi.org/10.1016/S0092-6566(03)00025-4.

Scharlott, B. W., & Christ, W. G. (1995). Overcoming relationship-initiation barriers: The impact of a computer-dating system on sex role, shyness, and appearance inhibitions. *Computers in Human Behavior, 11*(2), 191–204. http://dx.doi.org/10.1016/0747-5632(94)00028-G.

Steiger, J. H. (1980). Tests for comparing elements of a correlation matrix. *Psychological Bulletin, 87*(2), 245–251. http://dx.doi.org/10.1037/0033-2909.87.2.245.

Tosun, L. P., & Lajunen, T. (2010). Does internet use reflect your personality? Relationship between Eysenck's personality dimensions and internet use. *Computers in Human Behavior, 26*(2), 162–167. http://dx.doi.org/10.1016/j.chb.2009.10.010.

Turkle, S. (1997). *Life on the screen: Identity in the age of the internet*. London: Phoenix.

Whitty, M. T., & Buchanan, T. (2009). Looking for love in so many places: Characteristics of online daters and speed daters. *Interpersona, 3*(Suppl. 2), 63–86. http://dx.doi.org/10.5964/ijpr.v3isupp2.76.