

# Manifestations of Personality in Online Social Networks: Self-Reported Facebook-Related Behaviors and Observable Profile Information

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## Abstract

Despite the enormous popularity of Online Social Networking sites (OSNs; e.g., Facebook and Myspace), little research in psychology has been done on them. Two studies examining how personality is reflected in OSNs revealed several connections between the Big Five personality traits and self-reported Facebook-related behaviors and observable profile information. For example, extraversion predicted not only frequency of Facebook usage (Study 1), but also engagement in the site, with extraverts (vs. introverts) showing traces of higher levels of Facebook activity (Study 2). As in offline contexts, extraverts seek out virtual social engagement, which leaves behind a behavioral residue in the form of friends lists and picture postings. Results suggest that, rather than escaping from or compensating for their offline personality, OSN users appear to extend their offline personalities into the domains of OSNs.

## Introduction

OVER THE PAST 5 YEARS, Online Social Networking sites (OSNs) like Facebook and Myspace have become a central, virtually unavoidable medium for social interactions. OSNs started by catering to specialized communities and niche groups<sup>1</sup> but have since expanded their reach substantially, permeating virtually every stratum and demographic group in the developed world.<sup>2</sup> As such, they now provide fertile, ecologically valid, and empirically tractable domains in which to examine ongoing, real-world phenomena and processes in social and personality psychology.<sup>3</sup> Despite their psychological richness, and despite being the topic of widespread speculation, OSNs have remained relatively unexplored from an empirical perspective.

To map out the basic connections between personality and OSN behavior, we present two descriptive exploratory studies<sup>4</sup> to begin examining how traits are expressed on Facebook, currently the most widely used OSN in the world. Specifically, we examine the personality correlates of self-reported Facebook usage (Study 1) and some ways in which personality traits are expressed in terms of observable information found on Facebook profiles (Study 2); we also examine the extent to which observers are sensitive to the ways in which personality is manifested on profiles.

Two competing hypotheses have been proposed to describe the relationship between offline and online behavior.

The rich-get-richer hypothesis argues that individuals with pre-existing social structures and socially adaptive personalities will reap larger social benefits from Internet use and will use the Internet more for social communication than will individuals who are less socially adept.<sup>5</sup> In contrast, the social-compensation hypothesis argues that individuals who struggle to make social connections in face-to-face interactions will use the Internet as a place to enhance their interpersonal lives by forging social relationships online.<sup>6</sup>

Some early research on aggressive behavior online suggested that online personality could diverge from offline personality,<sup>7</sup> but others have argued that those studies were based on forms of media (e.g., flaming in chat rooms) in which users had no expectation for future interactions.<sup>8</sup> Supporting the idea that online social processes mirror those conducted offline,<sup>9</sup> recent research suggests that people largely use online tools to maintain their existing relationships,<sup>10–13</sup> people who are liked in offline context are also liked online,<sup>14</sup> and, mirroring offline findings, those who use OSNs more frequently also possess greater social capital.<sup>15</sup> Despite this research pointing to similar socialization processes in offline and online contexts, research focusing specifically on personality processes in online contexts is scarce.

The deliberate (e.g., identity claims) and inadvertent (e.g., behavioral residue) processes<sup>16</sup> by which personality traits become expressed in physical,<sup>17</sup> aural,<sup>18</sup> social,<sup>19</sup> and virtual environments<sup>20,21</sup> could play the same role in OSNs. Indeed,

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TABLE 1. PERSONALITY AND SELF-REPORTED FACEBOOK-RELATED BEHAVIORS (STUDY 1)

	<i>E</i>	<i>N</i>	<i>C</i>	<i>A</i>	<i>O</i>
Number of friends reported	0.40*	0.01	−0.03	0.03	0.10
Hours per week spent on Facebook	0.18*	0.13	−0.17*	0.07	0.01
Frequency of					
Viewing any page	0.28*	0.05	−0.20*	0.17*	0.11
Viewing another person's page	0.27*	0.02	−0.05	0.20*	0.10
Commenting on another person's page	0.30*	0.02	−0.01	0.13	0.14
Viewing own page	0.29*	0.10	−0.16*	0.18*	0.02
Editing typed information on own page	0.13	−0.07	−0.06	0.10	0.10
Adding photos of yourself pictured alone	0.02	0.10	0.07	0.02	0.04
Adding photos of yourself pictured with others	0.25*	0.07	−0.03	0.11	0.11
Adding photos of other people, without yourself	0.26*	0.05	0.03	0.11	0.16*
Replacing profile picture	0.26*	0.03	−0.09	0.10	0.17*

Note:  $n = 157$ .

\* $p < 0.05$ .

*E*, extraversion; *N*, neuroticism; *C*, conscientiousness; *A*, agreeableness; *O*, openness.

studies have linked narcissism<sup>22</sup> and extraversion<sup>23</sup> to objectively coded information on OSN profiles, and findings showing that OSN users' personalities are generally seen accurately by observers<sup>24</sup> provide indirect evidence that personality is expressed in Facebook profiles.

### Study 1: Personality and Self-Reported Facebook-Related Behaviors

The goal of Study 1 was to examine the associations between personality and a range of self-reported Facebook activities. Despite a relative dearth of studies examining links between personality and Facebook usage, findings showing the similarities between offline and online socialization processes suggest that those who spend more time socializing in an offline context should also socialize to a greater degree on Facebook.<sup>10–15</sup> Those higher in extraversion possess more social capital, spend more time socializing in general,<sup>25</sup> and report using the Internet with greater frequency.<sup>26</sup> As such, those higher in extraversion should also socialize more on Facebook and, thus, report increased use of a variety of Facebook features.

#### Method

**Participants.** Participants ( $n = 159$ ; 68 percent female) were drawn from a psychology student subject pool at Washington University in St. Louis. Of those who indicated their ethnicity, 11 (7 percent) reported being African American, 29 (18 percent) reported being Asian, 107 (68 percent) reported being white or Caucasian, and 10 (6 percent) indicated other. Only four participants reported that they used Facebook less often than once a week.

**Questionnaires.** Personality: Participants' standing on the five factor model (FFM) personality traits was assessed using the Ten Item Personality Inventory (TIPI),<sup>27</sup> which measures the Big Five personality dimensions (extraversion, neuroticism, conscientiousness, agreeableness, and openness to experience) with two Likert-type scale items tapping each dimension. The TIPI has shown high levels of convergence with the commonly used Big Five Inventory.

Facebook-related behaviors: Participants' Facebook-related behaviors were assessed using an 11-item self-report

measure (see Table 1). Two of these items were open-ended numeric response items (number of friends and hours per week) and the remaining items were assessed on a 1 (*never*) to 5 (*multiple times each day*) Likert-type scale.

**Procedure.** Participants came into the lab one at a time and completed all measures on a computer. Items from each measure were presented in a randomized order.

#### Results and discussion

The correlations between participants' FFM scores and their self-reports of their Facebook-related activities suggest that personality traits are manifested in Facebook behaviors (see Table 1). Controlling for the influence of demographic variables (age, sex, and ethnicity) did not significantly alter the effect size estimates or the pattern of significant findings.

Consistent with the idea that OSN behavior parallels offline behavior, OSNs seem to be used by extraverts as yet another medium through which to exercise their need for socialization. Specifically, extraversion was correlated with a large number of self-reported Facebook behaviors, especially those related to maintaining an up-to-date presence and tending to social bonds (e.g., number of Facebook friends and commenting on another's page). Agreeableness, the other interpersonal FFM dimension, was also related to OSN usage; those higher in agreeableness viewed all pages (i.e., any, others, and their own pages) more often than those low in agreeableness. Consistent with the idea that OSNs serve as an opportunity for those low in conscientiousness to procrastinate, participants low on conscientiousness spent more time viewing pages and more time on Facebook than did those high in conscientiousness. Finally, openness was related to adding and replacing photographs, which may reflect the fact that individuals high on this trait tend to engage in a wide range of activities. Neuroticism was not related to any of the self-reported Facebook behaviors.

### Study 2: Personality and Observable Information on Facebook Profiles

Study 1 revealed associations between Facebook-related activities and personality that seem consistent with

associations observed in offline contexts. However, the findings were based on self-reports, so they could have reflected self-views rather than actual behavior. Moreover, only a subset of behaviors leave discernable residue in their wake, so the self-reported behaviors (e.g., merely viewing a page) in Study 1 may not have produced residue in OSNs that is detectable from an observer's perspective. In Study 2, we examine whether objectively assessed observable information found on Facebook profiles is associated with personality traits. By looking at the residue of behavior we can also examine whether personality differences are manifested on Facebook in detectable interpretable ways by assessing the degree to which observers correctly interpret this information when forming personality impressions based on Facebook profiles.

We once again expect that extraversion will predict a variety of behavioral traces coded from participants' profiles. In addition, past research has shown that individuals can accurately detect cues of extraversion on manipulated Facebook profiles,<sup>23</sup> so we expect that individuals will be able to accurately detect extraversion based on Facebook profiles, and do so using information that is actually diagnostic of the profile owner's level of extraversion.

### Method

**Participants.** Participants ( $n = 133$ ; 61 percent female;  $M = 18.8$ ,  $SD = 1.1$ ) from the University of Texas at Austin received \$10 compensation for their participation, and were entered into a lottery with a 12 percent chance of winning \$100, and received partial fulfillment of course requirements if they were enrolled in Introductory Psychology (76 of them were). Participants were recruited by posting flyers in dorms, making announcements in Introductory Psychology classes, and handing out candy and flyers at busy campus intersections. Participants signed up by visiting a Web site and completing a form, which required five people to sign up together who were previously acquainted friends. The advertisements and Web site described the research as a study of personality and behavior, but there was no mention of Facebook or social networking. Participants were provided with feedback about their personality when the study was completed. Of those participants who indicated their ethnicity, 56 (42 percent) reported being Asian, Asian-American, Indian, or Pacific Islander; 53 (40 percent) reported being white or Caucasian; 13 (10 percent) reported being Hispanic or Latino/a; 9 (7 percent) reported being black or African-American; and 2 (2 percent) indicated other.

**Facebook profile pages.** To create the stimuli, Facebook profiles were saved before making any mention of Facebook to the participants. The stimuli were identical to the targets' actual profiles except that the links within the profiles were not active. Observers could only peruse a target's main profile page and a sample of the target's photos. Facebook users routinely look through other users' picture galleries so we felt that observers should be able to consider a target's photos when making personality assessments. However, some users have hundreds of photos on their profiles, so, due to data and time constraints, we included up to 10 photos randomly selected from the galleries linked to a user's main page.

**Unacquainted observer ratings.** Nine undergraduate research assistants (five female) independently rated the personality of all 133 targets based solely on an examination of the targets' Facebook profiles. The observers were not involved with any other part of the study. To counter the effects of fatigue, observers made the ratings in sessions lasting no >2 hours. It took observers an average of 16 hours each to complete all the ratings over 5 weeks. Observers were asked to identify any targets with whom they were acquainted. Two observers reported being acquainted with one target each and so ratings were not made in these cases.

Instructions for the observers' personality assessments of the page owners were designed to allow the observers the freedom to browse the profiles in a realistic, unconstrained manner. Specifically, for each OSN profile, observers were simply instructed to "rate how well each trait describes the profile owner." Thus, these ratings represented proxies for how the profiles would be viewed by lay perceivers. Observer agreement (consensus) intraclass correlations ICC(2,k) calculated for the aggregate ratings using were 0.79, 0.32, 0.67, 0.47, and 0.60 for extraversion, neuroticism, conscientiousness, agreeableness, and openness, respectively.

**Facebook codings.** Each Facebook profile was coded in terms of eight types of information: number of photos ( $M = 110.5$ ,  $SD = 116.1$ ), number of photo albums (i.e., user-generated files, often thematic, in which photos are organized;  $M = 3.5$ ,  $SD = 5.8$ ), number of words in the free-response "about me" section ( $M = 39.0$ ,  $SD = 77.4$ ), number of wall posts (the wall is a user's publicly viewable bulletin board where friends can post notes;  $M = 210.4$ ,  $SD = 172.5$ ), number of groups (groups are pages to which a user can link, usually based on a common interest;  $M = 26.1$ ,  $SD = 19.7$ ), number of friends in local network (the local network is the primary group to which a user is affiliated, usually associated with a region or organization;  $M = 145.2$ ,  $SD = 97.1$ ), total number of friends (i.e., profiles of other users to whom the user has linked his or her profile;  $M = 322.8$ ,  $SD = 197.3$ ), and number of networks (i.e., groups of users linked by a common region or organization;  $M = 65.7$ ,  $SD = 40.4$ ). The codings were made by a researcher who did not contribute to the observer ratings.

**Accuracy criteria.** The perspectives provided by the self and well-acquainted peers both contribute unique, valid information about a person's personality.<sup>28</sup> Thus, it is generally believed that the best validity criterion is one that combines both perspectives.<sup>21,29-31</sup> Therefore, an accuracy criterion was created by combining self-reports and reports from four well-acquainted informants. The informants completed their reports using a peer-report version of the TIPI (see below) during the experimental session; the TIPI scale was modified such that a 15-point scale was used and raters had to rate themselves and their four friends on it, giving everyone a different rating. Obviously there was some overlap between the information available to the observers and the self and informants because all three had access to the Facebook profiles. To ensure that all perspectives contributed equally to the accuracy criterion, the reports were averaged and weighted equally such that the one self-report for each participant comprised one-fifth of the accuracy criterion and the four friend-reports made up the remaining four-fifths.<sup>32-34</sup>

TABLE 2. ASSOCIATIONS BETWEEN FACEBOOK USER FEATURES AND PERSONALITY AND IMPRESSIONS OF PERSONALITY (STUDY 2)

	<i>Extraversion</i>		<i>Neuroticism</i>		<i>Conscientiousness</i>		<i>Agreeableness</i>		<i>Openness</i>	
	<i>Crit.</i>	<i>Observ.</i>	<i>Crit.</i>	<i>Observ.</i>	<i>Crit.</i>	<i>Observ.</i>	<i>Crit.</i>	<i>Observ.</i>	<i>Crit.</i>	<i>Observ.</i>
Number of photos	0.28*	0.34*	0.14	−0.04	0.01	−0.08	−0.08	−0.01	0.15	0.26*
Number of photo albums	0.20*	0.12	0.12	0.02	0.01	−0.10	−0.03	−0.01	0.04	0.07
Words in the “about me” section	0.06	0.21*	0.11	−0.15	−0.06	0.03	−0.04	−0.16	0.12	0.15
Number of wall posts	0.26*	0.48*	0.11	−0.07	0.06	0.01	0.06	−0.09	0.11	0.08
Number of groups	0.28*	0.35*	0.17	−0.09	−0.11	−0.01	−0.16	−0.14	0.12	0.31*
Number of friends in local network	0.48*	0.49*	0.16	−0.05	0.00	0.16	−0.07	−0.13	0.24*	0.00
Total number of friends	0.49*	0.52*	0.08	−0.05	0.08	0.11	0.04	−0.09	0.27*	0.05
Number of networks	0.38*	0.43*	0.03	−0.06	0.02	0.04	0.02	−0.18*	0.22*	0.06

Note:  $n = 133$ .

\* $p < 0.05$ .

Crit., accuracy criterion; Observ., aggregated observer impression of personality based on Facebook page.

The combined reports formed reliable composites, with ICCs of 0.76, 0.72, 0.65, 0.73, and 0.56 for extraversion, neuroticism, conscientiousness, agreeableness, and openness respectively. The correlations between the accuracy criteria and the observer ratings were 0.46, −0.13, 0.27, 0.20, and 0.39 for extraversion, neuroticism, conscientiousness, agreeableness, and openness, respectively.<sup>35</sup>

**Personality questionnaire.** Targets, informants, and observers made their ratings on the TIPI (see Study 1).<sup>27</sup>

### Results and discussion

The correlations shown in Table 2 reveal a number of links between the observable information on Facebook profiles and the targets' actual personalities. As in Study 1 and consistent with the way extraversion is manifested in offline contexts, extraversion was related to the observable information associated with maintaining social connections with others; for example, extraversion was strongly correlated with the number of friends overall ( $r = 0.49$ ) and the number of friends in the local network ( $r = 0.48$ ). The only other FFM dimension associated with the information we coded was openness, which was correlated with the number of friends overall, the number of friends in the local network, and the number of networks (see Table 2). Consistent with the idea that some self-reported behaviors (the frequency-of-use behaviors) examined in Study 1 would not leave a residue in their wake, we observed no relationships between conscientiousness or agreeableness and the observable profile information. The other two FFM personality dimensions were not related to the observable Facebook information.

The analyses of the personality judgments made by the unacquainted observers suggest that observers were able to make good use of the available profile information when they formed their impressions of the targets (see Table 2). That is, the unacquainted observers rating the profile owners' personalities seemed to use the elements of information (e.g., number of friends) that were valid indicators of personality (mainly extraversion) and ignored the elements of information (e.g., number of wall posts as indicators of conscientiousness) that were not diagnostic of personality. However, the unacquainted observers' success in using valid cues varied across traits. In particular, openness judgments were associated with cues that were not valid (number of photos and

number of groups) and were not associated with cues that were valid (number of friends overall, number of friends in local network, and number of networks).

### General Discussion

In two studies, this research revealed a number of connections between personality and Facebook-related behavior. Extraversion predicted not only self-reported frequency of Facebook usage (Study 1), but also engagement in the site, with extraverts (vs. introverts) leaving observable traces of higher levels of OSN activity (Study 2). Consistent with socialization in offline contexts, extraverts seek out virtual social contact and are more engaged during online social experience than are introverts. In the case of social networking sites, this engagement leaves behind a behavioral residue in the form of friends lists, picture postings, and so on. Similarly, rather than providing an opportunity for conscientious people to loosen their collar, OSNs may instead provide another haven in which low conscientious procrastinators can avoid getting down to work. Openness is also expressed as it is in the offline-world with evidence of exploring new activities, experiencing new people, and changing the photographic scenery. Thus, rather than being an escape from reality, OSN sites exist as a microcosm of people's larger social worlds.

Consistent with previous research,<sup>24,36</sup> the analyses of impressions based on Facebook profiles (Study 2) showed that observers can make effective use of observable profile information when they form their impressions. This effect was particularly evident for extraversion. Although we did not identify any openness cues that were both valid and used by observers, the fact that observer impressions of openness did show some accuracy indicates that observers must be picking up on some valid cues when they form their impressions; it is for future research to identify what these cues might be.

Generally, our findings converge with other research to suggest that individuals are able to use observable profile information—be it the number of friends, photos, or another feature—to form accurate impressions of at least some basic personality traits. However, our research also showed that observers seemed to neglect some of the valid cues. These findings showing that some traits are manifested more clearly than others are consistent with the growing body of research



showing that different traits are manifested in different contexts.<sup>16,37</sup>

The patterns of cue usage identified here can be viewed within the framework of Funder's Realistic Accuracy Model (RAM).<sup>29</sup> RAM holds that accurate personality judgments require that a target emits cues that are relevant and available and these cues are detected and appropriately utilized by the an observer. Our findings suggest that for judgments of extraversion, all the elements of the RAM are satisfied, but for openness judgments, accuracy is interrupted at the stages of detection and/or utilization. In the context of OSNs, neuroticism might not even emit cues that are relevant and available. Such an interpretation would be consistent with Vazire's Self-Other Knowledge Asymmetry model,<sup>28</sup> which holds that unobservable traits like neuroticism are difficult to judge by others relative to observable traits like extraversion.

More broadly and consistent with previous research in the context of likability,<sup>14</sup> these findings demonstrate that social and personality processes are alive and well in OSNs, and parallel the processes in nonvirtual environments. Future research should examine how other processes (e.g., attraction and social influence) and aspects of personality (e.g., attitudes, values, and identity) are manifested in this context.

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