RUNNING HEAD: Face to (Face)Book

Face to (Face)Book: The Two Faces of Social Behavior?

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Abstract

Social networking sites such as Facebook represent a unique and dynamic social environment. OBJECTIVE: This study addresses three theoretical issues in personality psychology in the context of online social networking sites: (1) the temporal consistency of Facebook activity, (2) people's awareness of their online behavior, and (3) comparison of social behavior on Facebook with self- and informant-reported behavior in real life. METHOD: Facebook Wall pages of $N = 99$ college students (mean age = 19.72) were downloaded six times during three weeks and coded for quantity and quality of activity. Everyday social interactions were assessed by self- and friend-report. RESULTS: Facebook activity showed significant

consistency across time and people demonstrated awareness of their online behavior. There was

significant similarity between everyday traits and interactions and Facebook behavior (e.g., more

posts by friends are related to agreeableness). Some differences between online and everyday

interactions warrant further research (e.g., individuals with more positive offline relationships are

less likely to engage in back-and-forth conversations on Facebook). CONCLUSIONS: The

results indicate substantial similarity between online and offline social behavior and identify

avenues for future research on possible use of Facebook to compensate for difficulty in everyday

interactions.

Key Words: Facebook, social networking, temporal consistency, behavior, interpersonal traits

Young adults live both on the internet, most often on Facebook, as well as in everyday,

offline social environments. More than 90% of college students are Facebook users and spend

substantial time online (Ellison, Steinfeld, & Lampe, 2006). Facebook pages present the

individual to the larger social world and mark social milestones. For instance, college student

romantic relationships are serious only when they become "Facebook official" – when the

partners mention dating on their Facebook pages (Kenen, 2007). Popular media decry the

negative effects Facebook has on 'real life' social relationships (Fergus, 2009). However, there

is very little research directly observing social behavior on Facebook.

Recently, Baumeister, Vohs, and Funder (2007) lamented the dearth of psychological research on actual, meaningful social behavior. Facebook offers a unique opportunity to examine behavior in a socially relevant environment. Social interactions are fully observable on the website where every upload, update, and comment is recorded. As in everyday interactions, people meet others and develop social networks and individuals vary in their popularity. But unlike face-to-face interactions, the online environment enables a great deal of control over how people present themselves and how they communicate with others.

Overview of the Present Research

The present study has a broad goal of examining social behavior in the context of Facebook. Our research questions address key theoretical issues in personality psychology. First, we examine the consistency of behavior on Facebook across three weeks. Second, we test whether people are aware of how they typically use Facebook by comparing their self-reported and observed online behavior. And third, we compare observed behavior on Facebook and self-reported and informant-reported offline behavior.

Is Facebook Activity Consistent Over Time?

The first research question addresses consistency of Facebook activity across three weeks. We examine temporal stability in the volume and content of Facebook activity. We hypothesize, based on the work reviewed below, that there will be substantial stability in Facebook behavior and that cross-time consistency for Facebook behavior will be similar to that for offline behavior.

Fleeson and Noftle (2008) defined different ways to conceptualize behavioral consistency and argued that each kind is sufficient to infer the influence of personality on behavior. In this paper we examine consistency in terms of relative position similarity of single behaviors across

time. Consistency is defined as individual's similar rank order position compared to other

people's position on a certain behavior across multiple points in time. Previous studies found

high consistency in self-reported trait relevant behavior (e.g., being talkative, cooperative etc.)

during three weeks (Fleeson, 2001), as well as high consistency of social behaviors reported in

two-week long diary-like study (Wu & Clark, 2003).

Consistency is also found in verbal behavior over time. Mehl and Pennebaker (2003)

recorded samples of college students' speech for two days and again four weeks later. Linguistic

analyses showed that spontaneous word use was relatively stable over time, both for linguistic

variables (e.g., pronouns and articles), and psychological processes (e.g., social and emotion

words). Accordingly, in the present study we examined behavioral consistency across time on

Facebook. Specifically, we measured the volume of activity (e.g., number of Facebook posts)

and the consistency of word use Facebook posts (e.g., articles, emotion words).

Are People Aware of Their Online Behavior?

We asked participants to report on their Facebook behavior in the previous two weeks

and we compared these self-reports with observed Facebook behavior. This question is

important theoretically, as it concerns the accuracy and boundaries of self-knowledge (Vazire &

Mehl, 2008). This question is also important practically because most studies of Facebook

behavior to date have used either retrospective (e.g., Ellison, Steinfield, & Lampe, 2007; Joinson,

2008; Reich, 2010; Ross, Orr, Sisic, Arseneault, Simmering, & Orr, 2009; Sheldon, 2008;

Steinfield, Ellison, & Lampe, 2008; Subrahmanyam, Reich, Weatcher, & Espinoza, 2008) or

diary-like self-reports (Pempek, Yermolayeva, & Calvert, 2009).

The relationship between self-reported and observed behavior has been studied in relation

to both global personality traits (e.g., extraversion) and in relation to specific acts (e.g., laughed

out loud). The average correlation between self and observer ratings of behavior is estimated to

be between .20 and .37 (Funder, Kolar, & Blackman, 1995; Gosling, John, Craik, & Robins,

1998; John & Robins, 1993). Gosling et al. (1998) compared self-reports of behavior acts in a

laboratory task with observer ratings of those acts. They found accuracy for some acts (e.g.,

making a humorous remark; acts conceptually related to extraversion), but less so for others

(e.g., interrupting others; acts related to agreeableness). Extending this research outside of the

laboratory, Vazire and Mehl (2008) had participants carry electronic devices that recorded

sounds around the person as they went about their daily lives and found that self-reports

correlated with observed location (e.g., at a coffee shop), kind of social interaction (e.g., talking

on the phone), activity (e.g., watching TV), and emotional expression (e.g., sighing).

In this paper we focus on behaviors pertaining to Facebook use. Although the amount

of research on Facebook is quickly increasing, no study thus far has compared self-reported and

observed online behavior. Our hypothesis was that people have significant awareness of their

online behavior so that, for instance, there is a positive correlation between how much emotional

expression people self-report and how much emotional expression can be observed in their posts.

We sought a direct comparison between self-reported and observed behavior whenever

possible (e.g., self-reports of emotional expression on Facebook and rated emotional expression

on Facebook pages). Unfortunately, two variables that received a lot of attention in previous

research (e.g., Baker & Oswald, 2010; Bergman, Fearrington, Davenport, & Bergman, 2011;

Buffardi & Campbell, 2008; Joinson, 2008; Orr, Sisic, Ross, Simmering, Arseneault, & Orr,

2009) – time spent on Facebook and attention seeking – could not be directly observed (e.g.,

Facebook does not offer information on how many times per day a person logs in or how long

they are logged in). Drawing on previous research, we were able to indirectly assess awareness

of these behaviors. Time on Facebook has been linked to the self-reported number of Facebook friends (Orr et al., 2009). Moreover, college students who seek attention on Facebook are described by their peers as friending large groups of people, including those who they don't personally know (Zywica & Danowski, 2008). Similarly, narcissism, a trait characterized by self-promotion, is associated with wanting to have as many friends as possible and wanting friends to know what one is doing (Bergman et al., 2011). If students are aware of their Facebook use, we expected to find a positive correlation between self-reported time on Facebook and the volume of online activity, as well as between attention seeking and the number of friends and status updates (variables associated with reaching a wide audience). Similarly, we hypothesized that self-reported emotional expression would correlate with observed emotional expression by the participants, and that self-reported use of Facebook to further everyday social life will positively correlate with observed announcing of everyday social events.

Facebook Compared to Interpersonal Traits and Offline Behavior

Our final research question examines the similarity between social behavior online and in everyday contexts. If people are able to accurately judge personality traits of Facebook users after examining their pages (Back et al., 2010), it is reasonable to assume that these judgments are based on observations of behavioral traces on the web pages that are similar to cues relevant for judging everyday personality. Indeed, judgments of narcissism are based on observations of quantity of social interaction and self-promotional content in profile photos on Facebook (Buffardi & Campbell, 2008).

Social outcomes on Facebook also overlap with those in everyday life. Survey research shows that extraverted individuals are more popular both on Facebook and offline (Sheldon, 2008; Zywica & Danowski, 2008). Experimental research shows that individuals who are

considered likable in brief face-to-face interactions are also considered likable based on their

Facebook profiles. Likeability based on Facebook pages is based on social expressivity cues

(e.g., number of friends, photos) and likeability in face-to-face interactions is based on nonverbal

expressivity (e.g., smiling, facial expressivity). Although the cues are different, their function –

expressivity – is similar across environments (Weisbuch, Ivcevic, & Ambady, 2009).

        Research on everyday social interactions shows that likeability as measured by peer-rated

popularity, sociometric nominations, and time spent interacting with others, is related to both

extraversion and agreeableness (Asendorpf, 1998; Jensen-Campbell, Adams, Perry, Workman,

Furdella, & Egan, 2002; Paunonen, 2003). Therefore, we hypothesize that likeability on

Facebook, as indexed by larger social networks and emotional expressiveness by friends, will be

correlated with extraversion and agreeableness and with behavioral expression of these traits

(e.g., amount of socializing and experiencing emotionally supportive relationships). We

hypothesize that the number of friends will be associated with extraversion and everyday

socializing, as well as agreeableness and experiences of emotional support. Similarly, we expect

a positive correlation between emotional expression from one's friends and the frequency of

friends' posts on one's Wall page and everyday agreeableness and emotional support.

        The similarity of behavior in different social environments depends on the overlap in the

features of these environments (Furr & Funder, 2004). There are two important differences

between Facebook and everyday offline contexts. First, Facebook makes it easier to approach

others and initiate relationships. While in face-to-face interactions socially anxious individuals

or those lacking social skills have difficulty with self-presentation (Creed & Funder, 1998;

Feldman, Philippot, & Custrini, 1991), they can easily send Facebook friending invitations.

Moreover, research shows that shy individuals who report heavily using Facebook also feel

closer to their online friends (Baker & Oswald, 2010). The second difference between Facebook

and everyday contexts is the degree of control over the interactions. Everyday interactions are

hard to control and represent challenges for less agreeable individuals (Berry & Hansen, 2000).

Survey research of adolescents and young adults shows that lonely and socially less skillful

individuals take advantage of these attributes of the online social environment to develop active

online relationships (Ellison et al., 2007; Valkenburg & Peter, 2007). Shy individuals have more

positive attitudes toward Facebook and report using it to feel less lonely (Orr et al., 2009;

Sheldon, 2008). Consequently, we hypothesize that more personally engaged Facebook

communication (higher volume of reacting to others' posts and back-and-forth conversations)

may be related to lower agreeableness and less emotional support in everyday friendships.

We observed the volume of Facebook activity, mode of activity, and the content of

Facebook Wall pages. We compared this observed Facebook behavior and self- and friend-

reported interpersonal traits and behavior in everyday contexts. Extraversion and agreeableness

were examined as major personality dimensions associated with interpersonal behavior (McCrae

& Costa, 1989). While extraversion describes the volume and variety of social behavior (e.g.,

popularity, attending parties; Paunonen, 2003), agreeableness describes prosocial motivations,

smoothness in social interactions, and friendship quality (e.g., Graziano, Habashi, Sheese, &

Tobin, 2007; Lopes, Brackett, Nezlek, Schutz, Sellin, & Salovey, 2004; Lopes, Salovey, Cote, &

Beers, 2005). Thus, we measured self- and friend-reported amount of social interactions and

quality of everyday friendships. We hypothesized a substantial degree of similarity across social

contexts, especially regarding the amount of social interactions. However, we also hypothesized

some differences across the two contexts, so that those who have more difficulty in face-to-face

interactions show more personal engagement on Facebook.

Method

Participants

The initial sample consisted of 104 college students at a public university in the

Northeast. Because 4 students reported not having a Facebook page and 1 student did not give

consent for her page to be downloaded, the final sample included 99 participants (79 female;

mean age = 19.72, SD = 1.56). The sample was largely Caucasian (94.9%).

Participants were invited to bring a friend to the assessment session in exchange for

additional course credit. Informant data was available for 66 participants in the final sample (42

female). Mean friendship duration was 4.01 years (SD = 5.48).

Procedure

Self- and informant-report data were collected in one assessment session. Participants

and informants completed the same set of measures. In the informant-report booklet, the items

were reformulated slightly to reflect the task of rating the behavior of friends.

To get access to participants' Facebook pages, a research account was created and used to

send 'friending' invitations. When participants accepted these invitations, their pages were

downloaded at 6 times during 3 weeks. We were able to see all parts of the target users' profiles,

which lead us to believe that participants did not use privacy tools to limit access to their pages.

We downloaded the pages on Mondays and Wednesdays. Because Facebook shows a

time stamp for each post, we used Monday downloads to identify posts dating from the previous

weekend (Saturday and Sunday) and Wednesday downloads to identify posts from two previous

school week days. Wednesday downloads were chosen to avoid the major 'party' days (which at

this institution include both Thursday and Friday).

Measures

Self- and informant-report measures.

Interpersonal Traits. Extraversion and agreeableness were assessed with the Big Five

Inventory (BFI; John, Donahue, & Kentle, 1991).   Participants made ratings using a 5-point

scale, from 1 (strongly disagree) to 5 (strongly agree).

Everyday Social Behavior. We assessed the quantity and quality of everyday social

behavior. Quantity of socializing was assed by 7 items asking about spending time with friends

in everyday activities (e.g., going to the movies or a concert, going to a party, having dinner

together). Two variables assessed the quality of everyday social behavior: conflict (6 items; e.g.,

having an argument, purposefully avoiding contact for more than a week, screaming at each

other), and experiences of mutual emotional support (6 items; e.g., talking about feelings,

seeking advice, helping friend with a personal problem). Items referred to close friends, but did

not ask participants to think of a specific friend. The items were rated on a 5-point scale.

Facebook Use. Time spent on Facebook was assessed by a single item. We also aimed to

measure attention seeking, social use of Facebook, emotion expression, and conflict (18 items

rated on 5-point scales). Because items aimed to measure conflict did not show satisfactory

reliability, we performed an exploratory factor analysis. Based on scree plot and interpretability

criteria, we identified 3 oblique factors. Items with loading greater than .35 were retained to

form linear composite scale scores: (1) *social use* – inviting Facebook friends to an event one

organized (.86), inviting Facebook friends to a party (.81), arranging to meet a Facebook friend

in person (.65), continuing communication started on Facebook by e-mail, phone, or in person

(.64), and sharing a joyful occasion on Facebook (.42); (2) *attention seeking* – saying something

in a post to attract attention (.78), doing something to attract attention online (.72), unfriending

someone (.61), friending someone one did not know (.57), embellishing a profile (.53); and (3)

expressing emotions – sharing emotions (.77), expressing sadness/problems/doubts (.73), asking

for advice (.60), filtering updates from some friends (.56), offering advice to a friend (.53). This

analysis showed consistency with previous research on self-reported Facebook use. For instance,

those who are perceived by their peers as trying to attract attention on Facebook are described as

attempting to friend those they don't personally know (Zywica & Danowski, 2008).

Observed Facebook behavior.

To examine the consistency of online behavior, we created two measures. First, we

counted the number of posts by participants, including status updates (i.e., short remarks in

response to the Facebook question "What's on your mind?"), photo, and video posts. The

number of posts was counted during two days prior to each download (Saturday and Sunday for

Monday downloads and Monday and Tuesday for Wednesday downloads). Two research

assistants independently counted the posts for one download with very high agreement (97.3%).

Disagreements were discussed and activity for the other downloads was recoded by one research

assistant (6 times points total). Second, we copied Wall posts for one week at the beginning and

one week at the end of the study. Comments by friends, automatically system-generated text

(e.g., time stamps), and personal names were deleted so that only participants' words were

retained. Participants' posts were analyzed using the text analysis software that counts the

number of words in categories of linguistic variables and psychological processes (LIWC;

Pennebaker, Francis, & Booth, 2001). We examined 5 linguistic variables – number of words

posted, emoticons, words of more than 6 letters, articles, and first person singular pronouns – and

3 variables of psychological processes – affect, cognitive mechanisms, and social processes.

To create broader measures of content of online behavior, research assistants rated Wall

pages at the beginning and at the end of the 3 study weeks for 4 sets of variables: social use of

Facebook, emotional expression, conflict, and popular culture posts (a common identity marker

in young adults; Pempek et al., 2009). Social use of Facebook was assessed through ratings of

explicitly social content in one's posts (online socializing, announcing offline events, silly or

joking content), by examining how often the person's friends post on their Wall (i.e., whether the

person is sought out and approached by others) and the level of communication on Facebook

(frequency of one sided posts vs. interactions and back-and-forth conversations). We

distinguished between emotional expression that comes only from the user and emotional

expression that comes from others (and therefore suggests social support and closeness).

Unfortunately, ratings of the hostile content on Wall pages had to be dropped because of low

interrater reliability.

Four research assistants rated Wall pages for the prevalence of 9 Facebook behaviors.

We distinguished between the mode (kinds of communication used) and content of Facebook

activity (subject matter of communications). The mode variables described the kind of social use

of Facebook and included: *friend updates* (i.e., the frequency of friends' posts on one's Wall

page; α = .87 for first download and .90 for the last download), *interactions* (i.e., minimal

communication online, including a status update and a response to it, such as when a friend

indicates liking a post; α = .92 and .90), and *conversations* (i.e., back and forth posts, where

there is a comment to a post and at least one reply by the original poster; α = .92 and .87).

The content of Facebook Walls was rated for: (1) three variables of social content:

socializing (e.g., 'Happy birthday to my roommate!'; α = .67 and .64), *announcing events* (e.g.,

'Everyone invited to the party on Main Street'; α = .68 and .87), and *joking* (α = .71 and .72), (2)

two variables of emotional expression: *participants expressing emotions* (e.g., 'Stressed'; α = .89

and .83), and *friends expressing emotions* (e.g., 'Missing you!'; α = .62 and .67), and (3) *pop*

culture posts (e.g., music lyrics in updates; α = .74 and .77). Ratings were done on a 7-point

scale, from 1 (the page does not include this type of posts) to 7 (most posts are of this type).

Descriptive statistics for all study variables are presented in Tables 1 and 2.

Results

The results are organized in three sections. First, we analyzed the consistency of

Facebook activity by comparing observations across the three study weeks. Second, we

examined participants' awareness of their own behavior online. Finally, we examined the

correlations among measures of social behavior on Facebook and in everyday interactions.

Is Facebook Activity Stable in Time?

We analyzed stability in online behavior across three weeks of observation for volume

and content of Facebook activity. The number of participants' posts was highly consistent across

the 6 time points during the three study weeks, each observing a 2-day period (α = .76). Cross-

time consistency in the content of the Facebook posts was examined by comparing the words

used in the first and the last week of the study. Six of the eight content variables showed

significant cross-time correlations, ranging from $r = .21$, $p < .05$ for first person singular

pronouns to $r = .67$, $p < .001$ for the number of posted words (Table 3). Insufficient variability

in more specific content categories (i.e., positive vs. negative affect) made it inappropriate to

conduct analysis on these variables.

Are People Aware of Their Online Behavior?

Correlations between self-reported and observed Facebook behavior indicated significant

awareness of online behavior (Table 4). Self-reported time spent on Facebook correlated with

measures of the volume of activity, including the number of friends ($r = .34$, $p < .001$), number

of photos ($r = .26$, $p < .01$), and the mean number of status updates ($r = .35$, $p < .001$). To assess

how people report their social use of Facebook, we asked questions about posting event

invitations to Facebook friends, arranging to meet a Facebook friend in person, and continuing a

communication started on Facebook offline. These self-reports were significantly correlated

with observations of participants announcing social events on Facebook ($r = .31$, $p < .01$). Self-

reported social use of Facebook showed marginally significant correlations with the total number

of friends ($r = .17$, $p < .10$) and observed online socializing ($r = .19$, $p < .10$).

Self-reported attention seeking on Facebook was related to measures indicating attempts

to reach a wide audience, such as a higher number of friends ($r = .31$, $p < .01$), more status

updates ($r = .31$, $p < .01$), and pop culture content ($r = .21$, $p < .05$). Finally, individuals who

reported sharing their emotions on Facebook were observed as more likely to express their

emotions online ($r = .29$, $p < .01$). Also, these individuals showed more active engagement

online by posting more status updates ($r = .32$, $p < .001$), using a more words in their posts ($r = .34$, $p < .001$), and having more back-and-forth conversations on Facebook (rs $= .20$, $p < .05$).

Facebook Compared to Interpersonal Traits and Offline Behavior

We compared measures of interpersonal traits and everyday social behavior with

measures of observed Facebook activity, including: (1) the volume of participants' Facebook

activity, (2) the mode of Facebook activity, and (3) the content in Wall posts. Table 5 shows

correlations between observed Facebook variables and everyday traits and interactions.

Supporting the similarity hypothesis, the total number of Facebook friends was related to

extraversion (self-reported: $r = .44$, $p < .001$ and friend-reported: $r = .37$, $p < .01$), everyday

socializing (self-reported: $r = .20$, $p < .10$ and friend-reported: $r = .29$, $p < .05$), and experiences

of emotional support (both self- and friend-reported $r = .26$, $p < .05$). Also, the number of posted

photos was correlated with self-reported agreeableness ($r = .21$, $p < .05$) and everyday emotional

support ($r = .32$, $p < .01$).

The content of Facebook Walls also showed similarity with everyday behavior.

Emotional expression by one's Facebook friends was related to agreeableness (self-reported: $r =$

.19, $p < .10$ and friend-reported: $r = .26$, $p < .05$) and everyday experiences of emotional support

(self-reported: $r = .20$, $p < .10$ and friend-reported: $r = .30$, $p < .05$). Since self-reports of

Facebook use show that pop culture posts are a way to attract attention of others, it is not

surprising that this content was related to less emotional support in everyday interactions (self-

reported: $r = -.33$, $p < .01$ and friend-reported: $r = -.24$, $p < .10$). Not every content variable of

Facebook behavior showed significant correlations with everyday traits and interactions. For

instance, joking and social content on Wall pages were not related to extraversion and

agreeableness. However, everyday emotional support was related to both online socializing

(self-reported: $r = .21$, $p < .05$ and friend-reported: $r = .24$, $p < .10$) and joking (self-reported: rs

$= .23$, and friend-reported: $r = .30$, both $p < .05$).

Finally, the mode of Facebook activity showed both similarities and some differences in

relation to everyday traits and behavior. As in everyday life, where agreeable individuals are

perceived as more approachable and likeable (e.g., Paunonen, 2003), agreeable individuals had

more posts from their friends on their Facebook Walls (self-reported: $r = .28$, and friend-

reported: $r = .34$, both $p < .01$). However, the frequency of back-and-forth conversations on

Facebook was correlated with lower agreeableness (self-reported: $r = -.21$ and friend-reported: r

$= -.28$, both $p < .05$) and to fewer everyday experiences of emotional support (self-reported: $r =$

-.19, $p < .05$ and friend-reported: $r = -.21$, $p < .10$).

Discussion

This study shows that Facebook has a number of similarities with everyday social contexts. College students' behavior on Facebook shows stability over time – across three weeks, our participants were consistent in the number of posts, numbers of words used, and in the kinds of words they used on their Wall pages. Participants were to a significant extent aware and were able to report what they did on Facebook. Finally, there were substantial similarities between online and offline social behavior, although some differences that warrant further research appeared as well. For instance, extraverted individuals had more friends on Facebook and agreeable individuals were more likely to have friends post on their Wall pages. However, individuals low on agreeableness tended to have more back-and-forth online conversations.

Consistency of Facebook Activity Over Time

Social behavior on Facebook was stable across the three study weeks. People tend to post similar number of posts across time and show significant similarity in the kinds of words used in their posts. Compared to consistency in word use in everyday spoken language (e.g., Mehl & Pennebaker, 2003), Facebook behavior is more consistent in the number of produced words and the number of words six letters or longer and it shows similar average consistency in words that indicate psychological processes (.21 on Facebook and .24 everyday). Because of low variability in word use indicating more specific psychological processes on Facebook (e.g., positive vs. negative emotion words), we were not able to conduct more detailed analyses and thus not able to make more detailed comparisons.

On the broader theoretical level, the results of this research are an important new piece of evidence regarding the influence of personality on behavior (Fleeson, 2001; Fleeson & Noftle, 2008). This is the first study that shows substantial behavioral consistency in observed online behavior. Consistency is apparent for participant-initiated activity (e.g., posting status updates),

linguistic variables (e.g., first person singular pronouns), and words indicating psychological

processes (e.g., affect and cognitive mechanisms).

Awareness of Facebook Behavior

People are largely aware of their behavior on Facebook. The present study did not match

specific single acts in self-reports and observations (as in Gosling et al., 1998; Vazire & Mehl,

2008), but rather examined conceptual matches on multiple item self-reports of behavior. This

approach was designed to reduce the random variation in assessment and increase the generality

of the reported behavior (Epstein, 1979; 1983). Those who reported consciously seeking

attention on Facebook were observed to have more friends and to post more status updates (thus

reaching more people), those who reported using Facebook to further their everyday social life

were observed to announce social events online, and those who reported expressing emotions on

Facebook were observed to post more emotional content.

Because self-reports are influenced by social desirability and considerations of self-

presentation (DeMaio, 1984), self-reports of online behavior can offer a glimpse into motives for

Facebook use and indicate ways in which these motives are expressed (Joinson, 2008; Ross et

al., 2009). For instance, self-reported attention seeking on Facebook was related to posting more

status updates, having more friends, and posting more pop culture content, suggesting that these

are strategies that people use to get noticed. However, such strategies can backfire. People who

reported wanting to attract attention on Facebook were also observed to have fewer posts by

friends on their Walls. Thus, while people seemed aware of their behavior on Facebook, they are

not necessarily aware of the consequences of their behavior.

Facebook Compared to Interpersonal Traits and Offline Behavior

Our study expands on research comparing personality impressions based on Facebook pages and self- and informant-ratings of personality (e.g., Back et al., 2010) and adds to the growing body of survey research on Facebook behavior (e.g., Joinson, 2008; Orr et al., 2008; Ross et al., 2009; Sheldon, 2008). Person-perception research suggests similarity between online and offline behavior. To the best of our knowledge, only one study so far directly addressed this question by comparing criteria of interpersonal liking based on Facebook profiles and brief face-to-face laboratory interactions (Weisbuch et al., 2009). Expressiveness on Facebook as well as in face-to-face nonverbal behavior correlated with likeability in the respective environments. This was an important step in defining apparent expressivity, but it examined a limited number of indicators of Facebook activity and it focused only on the social evaluation of likeability. In the present study, we created extensive observations of Facebook behavior, including the volume of Facebook activity, content and mode of communication on Facebook. Furthermore, instead of examining impressions strangers gained from Facebook pages, we compared online behavior with self- and informant-reported interpersonal traits and offline behavior.

Based on observations of Facebook activity, the present study showed substantial similarity between online and everyday traits and social behavior. Extraverted individuals had larger online social networks, agreeable individuals had more posts by their friends, and people who experienced more emotional support in everyday life had more friends on Facebook and more emotional expression from friends on their Wall pages. Our findings thus give observational support to previous survey research of Facebook behavior (e.g., Pempek et al., 2009; Sheldon, 2008; Valkenburg & Peter, 2007). For instance, Zywica and Danowski (2008) found that those higher on extraversion are more popular both online and off and Ross et al. (2009) found that extraversion was associated with membership in more Facebook groups.

The Facebook environment enables users to plan their posts and craft them for optimal self-presentation. As person-perception research shows (Back et al., 2010), college students do not take this opportunity – impressions of personality based on Facebook pages seem to reflect the actual and not the ideal self. College students might see Facebook as an extension of everyday life and not as a substantially different environment. They upload large amounts of personal information even though they are familiar with privacy and security issues (Debatin, Lovejoy, Horn, & Hughes, 2009). Users change their privacy settings only after experiencing a privacy invasion. Similarly, expressivity and disclosure on Facebook pages are related to nonverbal expressivity and verbal disclosure in a face-to-face interaction (Weisbuch et al., 2009).

Although there is substantial similarity between online and offline behavior, there seem to be some exceptions to this rule. Back-and-forth conversations on Facebook significantly correlated with lower agreeableness. The trait of agreeableness is associated with prosocial motivations, empathy, and helping behavior (Graziano et al., 2007; Graziano & Tobin, 2002). In face-to-face interactions trait agreeableness predicts emotional support and conflict resolution skills (Lopes et al., 2004), peer-rated interpersonal sensitivity, prosocial tendencies, and friendship quality (Lopes et al., 2005), as well as smoother social exchanges (Berry & Hansen, 2000). In the context of an online environment, they have an opportunity to continue an interaction that might not have been successfully carried on face-to-face. These results give observational support to survey research showing that less socially skilled individuals report greater investment in social networking sites (Ellison et al., 2007; Orr et al., 2009; Sheldon, 2008; Valkenburg & Peter, 2007). For instance, those who are more self-doubtful in everyday life strive for greater popularity online (Zywica & Danowski, 2008). Similarly, women low in

agreeableness report more engaged use of Facebook communication features, such as instant

messaging (Muscanell & Guadagno, 2011).

Limitations and Future Directions

With the advent of social networking web sites, social behavior ceased to be limited to

face-to-face interactions in everyday settings such as college dorms and coffee shops. Social

networking sites have many attributes of a distinct social environment – behavior on Facebook is

stable across time, people are significantly aware of their behavior, and individuals who are more

popular on Facebook also have more active offline social lives. However, online and face-to-

face social environments differ in respect to the ease and controllability, creating potential for

differences in behavior across the two social contexts. For instance, those who are less socially

skilled seem to be more deeply engaged on Facebook. While correlation certainly does not

imply causation, it is likely that individuals who have difficulty in everyday face-to-face

interactions find opportunities for elaborate social engagement online. Experimental research in

which individuals who are not skillful in face-to-face interactions are given the opportunity to

interact with peers either in person or on a social networking site would be able to explicitly test

this hypothesis. This research also has implications for understanding behavior in other online

and offline contexts, such as traditional vs. online classroom environments.

The present study is among the first to observe social interactions on Facebook and

compare online and offline traits and interactions. While we directly observed Facebook

behavior in substantial detail, behavior offline was assessed through self- and informant-reports.

This approach allowed us to economically study social behavior across different environments,

but it is also susceptible to the downsides of retrospective report measures (DeMaio, 1984).

Everyday behavior was assessed using items describing specific actions (e.g., not talking to a

friend for more than a week), as opposed to asking for general behavioral tendencies (e.g., whether one has a lot of conflict with friends). These questions require minimal interpretation and are less susceptible to response biases (Brackett & Mayer, 2006; Mael, 1991; Paunonen, 2003). Although the behavior reports were carefully constructed, validity in measuring everyday behavior would be enhanced by using more direct observations and a multimethod approach, including reports by multiple peers, diary or electronic recordings of everyday social life.

Another limitation in this study is that our measures of everyday behavior assessed general attributes of social interactions, while Facebook behavior was observed on multiple levels, from the most molecular level of the number of words used to more molar level of the frequency of conversations with friends. Because prediction is maximized when predictors and criteria are matched on breadth (Ackerman & Kanfer, 2004; Kraus, 1995), some correlations obtained in this study were likely attenuated. Methodology such as the Electronically Activated Recorder (EAR; Mehl, Pennebaker, Crow, Dabbs, & Price, 2001) that samples snippets of everyday conversations could enable observations of online and offline behavior of comparable levels of abstraction.

One of the goals of this research was to assess how aware people are of their online behavior. Because this was the first study comparing self-reported and observed Facebook behavior, we limited our investigation to few important variables such as time spent on Facebook, attention seeking, using Facebook to further everyday relationships, and emotional expression. This question can be investigated in more detail by including a greater number of variables and questions varying in specificity. Perhaps it is easier for an individual to accurately report whether they shared emotions in their Facebook posts (as assessed in our study) than it would be to report how many friends a person has in her social network or how many profile

pictures they have, as these variables tend to change frequently. Our goals for this study were limited, but they open other questions about the conditions and potential moderators of awareness of one's online behavior.

One important limitation of this study is that it did not examine negative social behavior on Facebook. Cyberbullying and social aggression are prominently featured in the news media (e.g., Hoffman, 2010) and are receiving a lot of scholarly interest (e.g., Hinduja & Patchin, 2008). We set out to observe hostility on Wall pages, but were not able to obtain reliable ratings, possibly because of the nature of interpersonal hostility on Facebook. This behavior might be relatively indirect and the hostile content could be reliably discerned only by people in a certain social network. For instance, messages indirectly pointing to a person being excluded from a social event can only be interpreted as hostile if the observers know that someone is being ostracized. This social behavior might also be relatively rare and require more focused study in order to be adequately assessed.

Finally, we have to be mindful of the nature of our sample. This study included Facebook users from one institution and the sample was middle class, Caucasian and skewed female. Women are more likely to use Facebook for maintaining existing social relationships, while men tend to use it to initiate new relationships (Muscanell & Guadagno, 2011). Our sample did not enable us to examine potential moderating role of gender in comparing traits and behavior on Facebook and offline. While we did not have a reason to anticipate a moderating role of gender in stability of Facebook behavior, awareness of online behavior, or similarity between Facebook and everyday behavior, future research would benefit from a more diverse and gender balanced sample.

This study is an empirical answer to the recent calls for a different kind of research in personality and social psychology (Baumeister et al., 2007; Funder, 2009a, 2009b; Rozin, 2009). These scholars decried the lack of direct observation of behavior in psychological research, as well as the study of non-representative behaviors and situations that offer convenient avenues for hypothesis testing. Instead, they called for the study of situations and behavior that are central to people's lives, and more descriptive and potentially hypothesis-generating research. We examined a socially meaningful context for self-expression and interaction with others that is increasing in popularity measured by the number of users and centrality in people's lives (Ellison et al., 2006). We observed behavior at different levels of analysis and followed it in time. Online social networking sites present an environment where individual behavior is relatively consistent in time and in which people have a certain insight about their behavior. The online environment provides means for self-expression and social contact that can enrich and possibly complement everyday social opportunities for social interaction.

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Table 1

Descriptive statistics for self- and informant-reported measures of everyday social interactions

Measure	Alpha	M	SD	Min	Max
Interpersonal traits					
Extraversion					
Self-report	.85	3.48	.76	1.75	4.88
Informant-report	.86	3.65	.80	1.75	5.00
Agreeableness					
Self-report	.76	3.93	.62	2.22	5.00
Informant-report	.85	4.05	.64	2.56	5.00
Everyday behavior					
Socializing					
Self-report	.80	2.98	.76	1.43	5.00
Informant-report	.74	2.93	.64	1.71	4.43
Emotional support					
Self-report	.76	3.10	.73	1.00	5.00
Informant-report	.74	3.24	.66	1.40	4.60
Conflict					
Self-report	.63	1.62	.50	1.00	4.00
Informant-report	.69	1.72	.54	1.00	3.83

Note. All variables measured on a 5-point scale.

Table 2

Descriptive statistics for variables of Facebook use

Measure	Alpha	M	SD	Min	Max
Observed variables					
Total friends		485.00	238.59	99.00	1269
Number of pictures		348.35	310.40	0	1302
Mean status updates		.44	.59	0	3.33
Word count		23.20	30.76	0	133.00
Content of Facebook activity					
Expressing emotions, participants	.86	1.87	.86	1.00	4.38
Expressing emotions, friends	.64	2.46	.65	1.13	3.88
Pop culture	.76	1.69	.69	1.00	4.25
Socializing	.65	2.82	.64	1.13	4.38
Announcing social events	.78	1.82	.69	1.00	4.13
Joking/silly	.72	2.93	.71	1.00	4.38
Mode of Facebook activity					
Friend updates	.88	4.84	1.09	1.88	6.75
Interactions	.91	2.29	.99	1.00	5.13
Conversations	.90	1.77	.78	1.00	5.13
Self-reported use					
Time on Facebook		2.66	1.10	1.00	5.00
Social use	.77	1.83	.75	1.00	4.00
Attention seeking	.74	1.61	.57	1.00	3.40
Expressing emotions	.69	1.58	.64	1.00	3.80

Note. Mean status updates are the average of six observations, each for a two-day period. All

other observed variables are the average of two observations (beginning and end of the three

weeks of study).

Table 3

Three-week stability in word use on Facebook Wall pages

Observed variable	Rest-retest reliability
Word count	.67***
Emoticons	.52***
Six letters or longer words	.34***
Articles	-.07
First person singular pronouns	.22*
Affect	.22*
Cognitive mechanisms	.24*
Social processes	.18†

Note. †*p* < .10; *p < .05; **p < .01; ***p < .001.

Table 4

Correlations between participants' self-reported and observed Facebook activity

	Time on Facebook	Attention Seeking	Social Use	Expressing Emotions
Volume of FB activity				
Number of friends	.34***	.31**	.17†	.08
Number of pictures	.38***	.14	.18	.17
Mean status updates	.35***	.31**	.03	.32***
Word count	.17†	.11	.06	.34***
Content of FB activity				
Expressing emotion, participants	.23*	.10	.05	.29**
Expressing emotion, friends	.36***	-.01	.09	.05
Pop culture	.12	.21*	-.07	.19†
Socializing	.24*	.04	.19†	-.02
Announcing social events	.24*	.22*	.31**	.02
Joking/silly	.17	.01	-.08	.13
Mode of FB activity				
Updates by others	-.02	-.23*	.06	-.22*
Interactions	.14	.09	-.07	.18†
Conversations	.04	.04	-.07	.20*

Note. †$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$.

Table 5

Correlations between observed volume, content, and mode of Facebook activity and measures of everyday social interactions

	Volume of activity				Content of activity						Mode of activity		
	Total friends	Total photos	Mean update	Word count	Pop culture	Em: friends	Em: part	Silly	Social	Events	Friend update	Interact	Convers
Interpersonal traits													
Extraversion													
Self-report	.44***	.12	.03	-.03	-.10	-.02	-.07	.05	.04	.09	.00	-.10	-.13
Informant	.37**	.12	.13	.00	.09	.07	.00	.00	.13	.19	.00	-.01	.05
Agreeableness													
Self-report	.21*	.21*	-.15	-.10	-.14	.19†	-.08	.11	.16	.00	.28**	-.17	-.21*
Informant	.00	.07	-.20	-.20	-.27*	.26*	-.16	.07	.15	-.24*	.34**	-.27*	-.28*
Everyday behavior													
Socializing													
Self-report	.20†	.11	-.03	-.06	-.22*	.08	-.03	.06	.09	.05	.05	-.22*	-.18†
Informant	.29*	.17	-.05	-.15	-.02	.28*	.04	.32**	.27*	.10	.17	-.09	-.17
Em support													
Self-report	.26**	.32**	-.06	-.06	-.33***	.20†	.00	.23*	.21*	.07	.17	-.22*	-.19†
Informant	.26*	.06	-.11	-.24*	-.24†	.30*	-.01	.30*	.24†	.13	.19	-.11	-.21†
Conflict													
Self-report	.26**	-.01	.04	.02	.12	-.05	-.04	.11	-.06	.14	-.10	.06	.10
Informant	.19	.05	.18	.01	.14	-.03	.18	.28*	-.06	.17	-.22†	.26*	.08

Note. †$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$. Total friends – total number of friends; Total photos – total number of photographs; Mean update – average number of status updates (based on 6 two-day periods); Word count – number of words in participants' posts (average from first and last page download 23 days apart); Pop culture – pop culture content on Wall pages; Em: friends – emotional expressiveness from participants' friends; Em: part – emotional expressiveness from participants; Silly – silly/joking content; Social – content indicating online socializing; Events – announcing face-to-face social events; Friend update – frequency of posts by friends; Interact – minimal online interaction (e.g., liking a post); Convers – back-and-forth conversations on Wall pages.