Does Facebook Magnify or Mitigate Threats to Belonging?

Megan L. Knowles, Nathaniel Haycock, and Iqra Shaikh
Franklin & Marshall College, Department of Psychology, Lancaster, PA, USA

Abstract. Previous research has yielded mixed findings regarding the interpersonal causes and consequences of Facebook use. The current research examines the role of belonging needs in motivating Facebook use and the protective value of Facebook following exclusion. In four studies we: manipulated exclusion and observed participants’ behavioral preferences (Study 1); measured participants’ belonging needs and their Facebook use (Study 2); and manipulated exclusion, exposed participants to either their Facebook photos/pages or control photos/pages, and measured need satisfaction and aggression (Studies 3-4). We found that exclusion motivated computer-mediated communication, and belonging needs predicted Facebook use. Also, exposure to Facebook protected excluded individuals’ social needs and mitigated aggressive behavior. Altogether, these studies suggest that Facebook is a powerful tool that allows individuals to reaffirm their social bonds.

Keywords: belonging, social exclusion, Facebook, social networks, aggression, social snacking

Undeniably, the internet is a versatile tool. Online, we search for information, shop for goods and services, make travel and dinner reservations, stream television shows and movies, and communicate with friends and family. Arguably, the social affordances of the internet are the most important for the average user (McKenna & Bargh, 1999). Through computer-mediated communication, people can connect with others instantaneously across any distance, or they can send email, texts, or messages on social networking sites (SNSs) like Facebook that allow for asynchronous communication (Boase & Wellman, 2006). At any moment, a Facebook user can wish a friend a happy birthday, upload photos of themselves and their friends, and scroll through their News Feed to learn what has been going on in their friends’ lives.

Facebook is not just a tool used to maintain and forge connections with others; it is also a repository of the user’s social life that can be accessed anywhere and anytime. Users’ social experiences can be captured in conversations and photographs on Facebook, and their friendships and group memberships are represented through their network of “Facebook friends.” Consequently, individuals with an impoverished sense of belonging may use Facebook as a resource to replenish their social stores temporarily. The current research examined just that question. Relatedly, the current studies also examined whether exposure to Facebook can stave off the pangs of social hunger, or if instead, it exacerbates one’s social needs.

The present investigation was informed by dozens of studies examining the relationship between social needs and computer-mediated communication (e.g., Facebook). Findings regarding loneliness, internet use, and SNS use are mixed. Internet use has been associated with increased loneliness (Kraut et al., 1998; Moody, 2001) as well as decreased loneliness (Fokkema & Knipscheer, 2007; Kraut et al., 2002; McKenna, Green, & Gleason, 2002; Moody, 2001). Interacting with others on SNSs seems to reduce loneliness (Burke, Marlow, & Lento, 2010) as does chatting with a stranger online (Shaw & Gant, 2002).

Unlike many of their predecessors, two recent studies examined the causal relationship between Facebook use and loneliness. In a longitudinal study, Kross and colleagues (2013) found that loneliness at one point in time predicted subsequent Facebook activity, suggesting that loneliness motivates Facebook use. Deters and Mehl (2012) found that experimentally induced increases in Facebook status updating lead to decreases in loneliness. That is, posting more status updates than usual actually made individuals feel less lonely.

The most rigorous tests of the loneliness-Facebook relationship reveal that lonely people are frequent Facebook users, and Facebook use (e.g., updating one’s status) reduces loneliness. Initial research on Facebook use and social connection reveals a similar pattern of findings. Sheldon, Abad, and Hinsch (2011) found that feelings of disconnection led people to use Facebook and that doing so gave them a sense of connection. Similarly, the more people reported using computer-based communication (e.g., email, text, Facebook, videochat) in another study, the more connected they reported feeling (Ahn & Shin, 2013). Also, older adolescent boys (but not girls) reported feeling more connected to their friend group if they were SNS users (Quinn & Oldmeadow, 2013). Altogether, these studies suggest that loneliness and disconnection increase Facebook use, which, in turn, increases feelings of connection.
Belonging Needs and SNS Use

Given the findings linking feelings of loneliness and disconnection to internet and SNS use, one might think that the need to belong motivates Facebook use (Nadkarni & Hofmann, 2012; Seidman, 2013). Indeed, Baumeister and Leary (1995) described our need to belong as a “pervasive drive to form and maintain... interpersonal relationships” (p. 497), and certainly, the internet and SNSs provide opportunities to do just that. To our knowledge, however, only one study has examined the relationship between belonging needs and Facebook use directly. Gangadharbatla (2008) found that people with a high need to belong report more willingness to join SNSs and more positive attitudes about SNSs. Still, we do not know whether these individuals’ attitudes would actually translate into greater SNS activity or whether acute belonging threats like exclusion motivate SNS use. The current investigation tests these related questions.

Past research suggests that SNSs like Facebook may serve belonging needs (Sheldon et al., 2011), but no studies have examined whether using Facebook protects individuals against social threat or instead exacerbates the threat. Two recent studies provide some insight into this question. Using young adult and adolescent samples, Gross (2009) measured participants’ self-esteem and perceived relational value, excluded or included participants in a virtual ball toss game, asked participants to play either a solitary computer game or communicate with an unfamiliar peer via instant messaging, and collected posttest measures among the excluded. Results revealed that excluded participants who interacted with someone over instant message reported higher self-esteem and perceived relational value than those who played a game by themselves. This study provides initial evidence that computer-mediated communication can benefit the rejected, however, it did not examine whether instant messaging, in this case, protects against social threat specifically. Instead, instant messaging may boost individuals’ self-esteem across the board—a finding that would be consistent with past work showing that instant messaging relieves emotional distress (Dolev-Cohen & Barak, 2013). Moreover, this study does not show whether exposure to a multifaceted SNS like Facebook would be as beneficial as direct communication with another person via instant message.

Using the same exclusion manipulation as Gross (2009), Knausenberger, Hellmann, and Echterhoff (2015) excluded or included participants, exposed them to either the Facebook icon or a control icon, and measured the extent to which they wanted to interact with future social interactions. Drawing on the social reconnection hypothesis (Maner, DeWall, Baumeister, & Schaller, 2007), Knausenberger and colleagues argued that participants in the control condition should desire social contact after exclusion; conversely, those in the Facebook condition would not desire social contact if the prime were restorative. Consistent with that hypothesis, excluded participants exposed to the control icon demonstrated more interest in future social contact than those exposed to the Facebook icon. Interestingly, this pattern only held for participants who reported using Facebook to fulfill their social needs—suggesting that simply being primed with Facebook can replenish people’s social stores if they believe Facebook has relational value. Notably, these findings emerged even though 78% of the sample did not report noticing the correct (or any) icon during the study, which suggests that conscious processing of Facebook’s relational value was not necessary for social need fulfillment.

The question remains as to whether direct exposure to Facebook would protect against rejection distress, or instead, exacerbate it. A subtle Facebook prime may be beneficial, but exposure to the site itself might produce stronger—and perhaps negative—effects. Using Facebook, especially for extended periods of time, can worsen individuals’ moods (Sagioglou & Geitemeyer, 2014). Also, reading negative feedback on one’s posts can harm one’s self-esteem and well-being (Valkenburg, Peter, & Schouten, 2006), failing to receive any responses from friends can threaten one’s fundamental social needs (Greitemeyer, Mügge, & Bollermann, 2014), and receiving no feedback on one’s status updates can lower one’s sense of belonging (Tobin, Vanman, Verreyne, & Saerl, 2015). If self-esteem were an indicator of one’s inclusionary status (Sociometer Theory; Leary, Tambor, Terdal, & Downs, 1995), then research by Forest and Wood (2012) would suggest that Facebook has the potential to hinder one’s inclusionary status even further. Specifically, they found that low self-esteem individuals tend to express more negativity in their status updates, which in turn decreases their likability. In other words, excluded people’s negative communication style on Facebook may actually push friends and family away and magnify their belonging needs.

Present Investigation

In the current investigation, we examined the spontaneous use of computer-mediated communication following acute social threats (Study 1), SNS use as a function of chronic belonging needs (Study 2), and the protective benefits of Facebook use following exclusion (Studies 3–4). We hypothesized that social exclusion motivates computer-mediated communication (e.g., use of Facebook, email, and texting) and individuals with chronically high belonging needs use SNSs with greater frequency than those with chronically low belonging needs. Given the benefits of concrete social reminders called “social snacking” in satiating one’s social hunger temporarily (Gardner, Pickett, & Knowles, 2005), we predicted that exposure to photographs of friends and family on Facebook would protect individuals’ fundamental needs from social threats but attractive, nonsocial photographs would not. Finally, we hypothesized that browsing Facebook might mitigate exclusion-induced aggressive tendencies whereas browsing fun, but nonsocial websites might not.
Study 1

The aim of the first study was to determine whether individuals spontaneously engage in social behavior via computer-mediated communication after experiencing a threat to their belonging needs. By conducting an experiment in a controlled setting, we hoped to provide empirical support causally linking heightened belonging needs and preferences for computer-mediated communication.

Method

Participants and Design

Forty-five undergraduates (30 female, 15 male; mean age = 18.44 years) participated for partial course credit. The study used a 2 (condition: excluded vs. included) between-subjects design.

Procedure

Pairs of participants arrived to a lab room where they were seated at adjacent desks separated by 6-foot partitions. At each desk, there was a personal computer and a stack of popular magazines. The experimenter explained that the study pertained to personality, attitudes, and preferences and one participant would be asked to complete a group task with two other people down the hall while the second participant would be asked to complete questionnaires instead. After the consent process, participants were asked to write a short self-descriptive statement that would be given to the other participants down the hall so that they could decide with whom they wanted to work. After participants finished their statements, the experimenter collected them and left the room to deliver them to the supposed others. Upon returning, he told the included participant that the group task was not ready and handed both participants a questionnaire to work on in the meantime. Participants were asked to report their gender, age, and what they did during their downtime earlier in the study. These self-reports were used to identify participants’ behavior when typing on their cell phones given the difficulty in distinguishing texting from email writing in some cases. Then, participants completed a manipulation check assessing the extent to which they felt accepted versus rejected.’ Participants could respond from −3 (definitely rejected) to 3 (definitely accepted). Finally, participants were probed for suspicion, debriefed, and dismissed.

Results and Discussion

Manipulation Check

First examining responses to the manipulation check, we found a significant effect of condition, $F(43) = 6.05, p < .001, d = 1.80$. With higher scores indicating greater feelings of acceptance, included participants reported feeling significantly more accepted ($M = 1.61, SD = 1.12$) than excluded participants ($M = -.64, SD = 1.36$). Thus, the manipulation was effective.

Behavioral Preferences

Two research assistants blind to condition coded participants’ behavior during the free period as “1” if they

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1 Because Study 1 was run in 2008, most participants were unable to access their email and Facebook on their cell phones at the time (e.g., Entner, 2010); instead, they used the desktop computers. If this study were replicated today, we would expect more participants to use their cell phones (vs. desktop computers) to communicate with friends via Facebook, YikYak, Snapchat, and other social media websites and applications.
engaged in social behavior via computer-mediated communication and “0” if they did not. The most common social behaviors were getting on SNSs, reading or writing email, and texting; the most common nonsocial behaviors were reading magazines and books, playing computer games, and doing schoolwork. Using this new dichotomous index, we ran a chi-square test of independence which revealed a significant effect of condition, $\chi^2(1, N = 45) = 3.74, p = .05$. Consistent with predictions, almost twice as many participants (59%) engaged in social behaviors via computer-mediated communication after exclusion than after inclusion (30%).

Additional analyses including gender revealed no differences in behavior between men and women. Furthermore, no significant main effects of gender or interactions involving gender emerged in subsequent studies. Consequently, gender will not be discussed further.

We also examined whether this difference in behavior was driven by excluded individuals’ preference for SNSs, in particular. We generated another dichotomized variable indicating whether the participant got on a SNS (coded “1”) or did not do so (coded “0”). Even though a larger proportion of excluded participants got on SNSs (23%) than included participants (9%), a chi-square test revealed no significant difference between conditions, $\chi^2(1, N = 45) = 1.69, p = .19$. While excluded participants were more likely to get on SNSs than included participants, their preference for social versus nonsocial behaviors extended beyond SNS to include texting and emailing as well. Consequently, we can conclude that SNSs provide one means of computer-mediated communication that appeals to excluded individuals, but SNSs are not necessarily preferred over other means of computer-mediated communication.

Study 2

The first study provided initial evidence that acute threats to one’s belonging needs motivate computer-mediated communication, such as the use of SNSs, email, and text messages. A second study was conducted to examine the extent to which individuals use Facebook, in particular, as a belonging maintenance strategy in their daily lives. Arguably, participants in Study 1 may have engaged in computer-mediated communication after exclusion in order to boost their self-esteem or mood rather than restore their sense of belonging. Consequently, in Study 2, we opted to assess chronic belonging needs directly rather than manipulate social threat. Additionally, we assessed other individual differences to examine them as potential moderators.

Specifically, we examined the role of social anxiety, which has been linked to internet and SNS use (e.g., Shepherd & Edelmann, 2005; Valkenburg & Peter, 2007). Also, we assessed the big five personality traits, with a particular interest in extroversion, considering past research linking extroversion and Facebook use (Gosling, Augustine, Vazire, Holtzman, & Gaddis, 2011; Wilson, Fornasier, & White, 2010). Given that extroverts typically belong to more Facebook groups and often have more Facebook friends than introverts (Gosling et al., 2011), Facebook may serve as a better social resource for extroverts with heightened belonging needs than introverts with similar needs.

Method

Participants and Design

Eighty-two undergraduates (47 female, 35 male; mean age = 19.21 years) participated in this correlational study in return for partial course credit.

Procedure

Participants in groups of 3–10 individuals completed the consent process and questionnaire packets. Packets included measures of belonging needs, social anxiety, extroversion, Facebook usage, and demographics in random orders. The 10-item Need to Belong Scale (NTBS; Leary, Kelly, Cottrell, & Schreindorfer, 2013) measured chronic belonging needs using items like “I want other people to accept me” and response options ranging from 1 (= not at all characteristic of me) to 5 (= extremely characteristic of me). A 20-item Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998) measured social anxiety using items like “I am tense mixing in a group” and response options ranging from 0 (= not at all) to 4 (= extremely). The Ten Item Personality Inventory (Gosling, Rentfrow, & Swann, 2003) measured the Big Five personality traits including extroversion. To indicate their location on the introversion-extroversion spectrum, participants reported the extent to which they were “extraverted, enthusiastic,” and “reserved, quiet” from 1 (= disagree strongly) to 7 (= agree strongly).

We assessed participants’ Facebook use in two ways. First, we measured the frequency of their Facebook use by asking them to report how many times each week they get on Facebook. Second, we measured participants’ willingness to make connections with strangers via Facebook by asking them if they have ever “friended” people they have never met. Participants also reported their age and gender prior to dismissal.

Results and Discussion

Frequency of Facebook Use

First examining the relationship between belonging needs ($M = 3.02, SD = .63, z = .79$) and Facebook use ($M = 24.87$ times/week, $SD = 37.72$), we regressed frequency of Facebook use on centered NTBS scores. As expected, a significant relationship emerged, $\beta = .31, t(80) = 2.73, p = .008$. To the extent individuals had a
strong need to belong, they reported using Facebook more frequently.

To examine the extent to which social anxiety \((M = 1.06, \ SD = .64, \ x = .92)\) and extroversion \((M = 4.91, \ SD = 1.54, \ x = .81)\) also contribute to Facebook use, we ran another regression with centered NTBS, SIAS, and extraversion scores entered in the first step and their interactions in the second step. This analysis revealed that belonging needs, \(\beta = .20, \ t(76) = 1.92, \ p = .052,\) and extroversion, \(\beta = .35, \ t(78) = 2.69, \ p = .009,\) predicted frequency of Facebook use, but these relationships were qualified by higher order interactions.

First, as illustrated in Figure 1, a significant NTBS × SIAS interaction emerged, \(\beta = .37, \ t(75) = 3.52, \ p = .001.\) To parse this interaction, we ran tests of simple slopes according to Aiken and West’s (1991) guidelines. For individuals who were not socially anxious (i.e., at one \(SD\) below the mean), belonging needs did not predict frequency of Facebook use, \(\beta = -.18, \ t(76) = -1.20, \ p = .235.\) However, for those who were socially anxious (i.e., at one \(SD\) above the mean), belonging needs significantly predicted frequency of Facebook use, \(\beta = .58, \ t(76) = 3.84, \ p < .001.\) Thus, chronic belonging needs seem to motivate Facebook use especially among those who suffer from social anxiety. These findings jibe with past research showing that socially anxious people may prefer online communication (Valkenburg & Peter, 2007). While their socially anxious counterparts are satisfying their belonging needs online, the non-anxious may be doing so through face-to-face communication instead.

Second, a significant NTBS × Extroversion interaction emerged, \(\beta = .33, \ t(75) = 3.20, \ p = .002,\) as depicted in Figure 2. Tests of simple slopes revealed that among introverts (i.e., participants one SD below the mean), belonging needs did not predict frequent Facebook use, \(\beta = -.15, \ t(75) = -1.02, \ p = .309.\) On the other hand, among extroverts (i.e., participants one SD above the mean), belonging needs significantly predicted the frequency of Facebook use, \(\beta = .55, \ t(75) = 3.93, \ p < .001.\) Doubly motivated to seek out social contact, extroverts with chronically high belonging needs were the most frequent Facebook users.

“Friending” Strangers on Facebook

In our sample, 45% of participants reported “ friending” a previously unknown person on Facebook and 55% had not. To examine whether chronic belonging needs predicted the “ friending” of strangers, we ran a logistic regression analysis. The test revealed a trend, \(\beta = .58, \ Wald = 2.39, \ p = .122,\) such that participants who had friended strangers \((M = 3.14, \ SD = .67)\) reported having higher NTBS scores than those who had never friended a stranger \((M = 2.93, \ SD = .57).\)

To examine the impacts of social anxiety and extroversion on the friending of strangers, we ran another logistic regression analysis including centered NTBS, SIAS, and extraversion scores and their interaction terms. This analysis revealed that NTBS scores predicted friending unknown others, \(\beta = .83, \ Wald = 3.79, \ p = .051,\) but no other variable or interaction term did so. This suggests that chronically high belonging needs — regardless of one’s social anxiety and extroversion — motivate the befriending of strangers on Facebook.

Altogether, these findings suggest that chronic belonging needs explain, at least in part, people’s Facebook use. Compared to those with weak belonging needs, those with strong belonging needs get on Facebook more frequently and are more likely to initiate friendships on Facebook. Moreover, Facebook appears to be a particularly attractive means of connection for extroverts and socially anxious individuals with strong belonging needs. Because both social exclusion and chronic belonging needs seem to motivate SNS use, we wanted to turn to the question of effectiveness. Does Facebook use reaffirm individuals’ social bonds and lessen the impact of social exclusion, or does Facebook magnify their sense of exclusion instead?

Study 3

Study 3 examined whether exposure to friends and family on Facebook would mitigate threats to one’s belonging needs. Given past research showing that concrete social
reminders can protect individuals from rejection distress (Gardner et al., 2005), we posited that exposure to photos of one’s Facebook friends can replenish one’s social needs after exclusion. We tested this hypothesis by manipulating exclusion, asking participants to browse Facebook or control photos, and assessing the extent to which their social needs are satisfied.

In Study 3, we manipulated exclusion by exposing participants to videos that simulate a conversation with another person who either averts his/her eye gaze or maintains eye contact, in the control condition. Borrowed from Wirth, Sacco, Hugenberg, and Williams (2010), this gaze aversion manipulation threatens individuals’ need to belong, consistent with previous research showing the social value of eye contact (e.g., Kleinke, 1986; Mason, Tatlow, & Macrae, 2005; Wesselmann, Cardoso, Slater, & Williams, 2012). We decided to use this particular manipulation because Wirth and colleagues had demonstrated its impact on individuals’ fundamental social needs, allowing us to replicate their study with an added Facebook intervention. Moreover, we wanted to use a brief, easily accessible manipulation that could be used out in the community, and these short videos allowed us to do so. Finally, we intended to use a new manipulation to determine whether exposure to Facebook would serve a protective function after exposure to a novel belonging threat.

**Method**

**Participants and Design**

On and around a college campus, 106 adults (57 female, 44 female, 2 genderqueer, 3 unidentified; mean age = 21.67 years) were recruited and paid 2 US$ for their participation. All participants reported having a Facebook account. The study used a 2 (gaze: averted vs. direct) × 2 (photos: Facebook friends vs. Flickr trees) between-subjects design.

**Procedure**

After the consent process, participants learned they would be completing a mental visualization exercise using a small tablet. This exercise served as our exclusion manipulation (Wirth et al., 2010). Participants were asked to watch a 2 min video of a (sex-matched) person and visualize interacting with him or her. For the first 30 s of the video, the person in the video looked directly at the viewer as if making eye contact with the participant. In the direct gaze condition, the person in the video continued to make eye contact for the remaining 2 min. In the averted gaze condition, the person spent the remaining 2 min looking from side to side as if he or she were avoiding eye contact with the participant.

After 2 min, the experimenters retrieved the tablets and pulled up a web browser. Participants in the Facebook condition were asked to log onto Facebook and browse through their photos, whereas participants in the Flickr condition were asked to browse through pictures of trees on the photo-sharing website Flickr. The stream of tree images was chosen to ensure that the control images were attractive but nonsocial in nature.

After another 2 min, experimenters retrieved the tablets and asked participants to complete some questionnaires. Participants completed the 20-item Assessment of Need Satisfaction scale (Jamieson, Harkins, & Williams, 2010) that measured the extent to which four fundamental needs (i.e., belonging, control, self-esteem, and meaningful existence) are satisfied using a scale ranging from 1 (= not at all) to 5 (= extremely). Past research has shown that the gaze manipulation influences participants’ responses across the four subscales (Wirth et al., 2010). Participants also completed three manipulation check items by reporting the percentage of time the “interaction partner” in the video looked at them and the extent to which they felt ignored and excluded by him/her. The latter two items used a scale ranging from 1 (= not at all) to 5 (= very much). Finally, participants provided demographic information and answered questions about their Facebook use for exploratory purposes prior to debriefing and dismissal.

**Results and Discussion**

First, we ran two independent samples t-tests on the manipulation check items. One test revealed that participants in the direct gaze condition (M = 88.04%, SD = 23.28) reported that their “interaction partner” looked at them significantly more than those in the averted gaze condition (M = 25.70%, SD = 19.93), t(101) = -14.63, p < .001, d = 2.88. Examining the average of the excluded and ignored items (M = 2.66, SD = 1.34, rSB = .82), the second t-test showed that participants in the averted gaze condition (M = 3.43, SD = 1.06) felt significantly more excluded and ignored by the “interaction partner” than those in the direct gaze condition (M = 1.86, SD = 1.11), t(102) = 7.40, p < .001, d = 1.47. These results confirm that the manipulation was effective.

To determine whether exposure to Facebook photos mitigates the impact of social exclusion on one’s fundamental needs for belonging, control, self-esteem, and meaningfulness, we first averaged the separate subscales. Finding that they were highly correlated (with rs ranging from .50 to .82), we generated a composite of all subscales and ran a 2 (gaze: averted vs. direct) × 2 (photos: Facebook friends vs. Flickr trees) between-subjects ANOVA on these scores. This analysis yielded a main effect of gaze condition, F(1, 101) = 16.17, p < .001, ηp² = .14, such that participants in the direct gaze condition reported greater need satisfaction (M = 4.11, SD = 0.59) than those in the averted gaze condition (M = 3.57, SD = 0.78). The anticipated Gaze × Photos interaction did not reach conventional levels of statistical significance, F(1, 101) = 2.32, p = .13, ηp² = .02, but the pattern of data was consistent with predictions, as shown in Figure 3. Subsequent tests of simple effects revealed that included participants reported
significantly more satisfied needs than excluded participants if they had viewed the control photos on Flickr, $F(1, 101) = 15.57, p < .001, \eta_p^2 = .13$, but this difference was much smaller if participants had viewed photos on Facebook, $F(1, 101) = 3.08, p = .08, \eta_p^2 = .03$. That is, condition (direct vs. averted gaze) explained 13% of the variance in participants’ need satisfaction if they viewed Flickr photos but only 3% if they had viewed Facebook photos, suggesting that Facebook more effectively mitigated the social threat associated with our gaze manipulation than Flickr. Finally, the remaining tests of simple effects revealed a marginal difference between participants in the averted gaze condition who viewed Facebook photos versus those who viewed control photos, $F(1, 101) = 2.93, p = .090, \eta_p^2 = .03$, and no difference between participants in the direct gaze condition who viewed Facebook photos versus those who viewed control photos, $F(1, 101) = .21, p = .645, \eta_p^2 < .01$.

These findings suggest that viewing photos of loved ones on Facebook protects their social needs after exclusion, but viewing attractive, but nonsocial photos is not similarly protective. Still, the impact of the Facebook manipulation was relatively weak. The small effect could be attributed to a couple of factors. First, we assumed that Facebook users would have sufficient numbers of photos depicting their friends and family, but perhaps their photo albums were comprised of nonsocial photos instead. Pictures of landscapes you took on your vacation might not be any more protective than pictures of trees on Flickr. Second, we required participants to be passive users of Facebook, and perhaps active use (e.g., messaging friends or posting comments) would more effectively boost feelings of belonging. These limitations motivated Study 4.

Study 4

In Study 4, we wanted to replicate the findings from Study 3 with novel manipulations and measures and determine whether active, self-directed Facebook use is more ameliorative of social threat than passive exposure to Facebook photos. To achieve these goals, we manipulated social exclusion using a virtual ball toss game, allowed participants to browse Facebook or a control website freely, and measured aggression using a noise blast paradigm. We assessed aggression because numerous studies have demonstrated that exclusion increases aggression, hostile cognition, and antisocial behavioral preferences (e.g., DeWall, Twenge, Bushman, Im, & Williams, 2010; DeWall, Twenge, Gitter, & Baumeister, 2009; Twenge et al., 2001; Twenge & Campbell, 2003; see Leary, Twenge, & Quinlivan, 2006, for a review). Moreover, some work suggests that reminders of social relationships (e.g., writing about friends and family) mitigate exclusion-induced aggression (Twenge et al., 2007). In light of this research, we hypothesized that excluded participants would demonstrate more aggression than included participants unless they had been given the opportunity to browse Facebook.

Method

Participants and Design

Seventy-six female undergraduates (mean age = 20.41 years) participated for partial course credit. The study used a 2 (Cyberball: included vs. excluded) × 2 (website browsed: Facebook vs. comics) between-subjects design.

Procedure

The experimenter told participants that they would be completing two tasks with other participants located elsewhere in the building. In reality, participants completed these tasks with computerized confederates instead. First, participants played Cyberball, a virtual ball toss game that is commonly used to manipulate social exclusion (Williams, Cheung, & Choi, 2000). During Cyberball, participants in the exclusion condition received the ball from the two computerized confederates only twice out of 20 throws; however, participants in the inclusion condition received the ball an equal number of times.

2 According to Williams (2007), Cyberball is more so a manipulation of ostracism than exclusion because it involves both ignoring and excluding elements. That said, we refer to Cyberball as a manipulation of exclusion in Study 4 given researchers’ greater familiarity with exclusion (see Schaafsma & Williams, 2012, footnote 1). We did not intend to differentiate between exclusion and ostracism by using different manipulations in the current investigation; instead, we hoped to demonstrate the broad protective power of Facebook when faced with various social threats.
After Cyberball, participants in the Facebook condition were asked to log on to Facebook and spend 4 min doing whatever they wanted. Conversely, participants in the comics condition were asked to browse the comics website http://www.gocomics.com and read whatever comics they wanted. All participants were told that they would be asked about their experiences on these websites later in the session.

Next, participants were told that they would be completing a Competitive Reaction Time task online with a new participant who had not played Cyberball. In this task, participants were instructed to hit the spacebar as soon as they heard a tone with the faster player winning that trial. When a player lost a trial by responding too slowly, she would be exposed to a burst of aversive white noise. Prior to each of the 25 trials, participants had the opportunity to select the volume of the noise blast her competitor would receive ranging from 1 (no noise) to 10 (100 dB). The average volume setting served as an index of aggression, similar to past research (Meier, Wilkowski, & Robinson, 2008). Unbeknownst to the participant, no second player existed, and the task was rigged so that the participants lost the first trial and received an 80 dB blast. Participants completed another 24 trials—ostensibly winning half and losing half—in a random order. Noise blasts followed each loss. See Meier et al. (2008) for more procedural details.

Participants then completed a series of questionnaires on the computer. To determine whether the comics and Facebook tasks were similarly enjoyable, we asked participants to report the extent to which they enjoyed spending time on Facebook or the comics website earlier in the session on a scale ranging from 1 (= not at all) to 5 (= very). For exploratory purposes, we asked participants to report what they did on Facebook or on the comics website earlier in the session and whether the experience was especially pleasing or displeasing. Also, for exploratory purposes, participants were asked how frequently they get on Facebook and how frequently they read comics. Finally, participants were asked to report the extent to which they felt included in Cyberball. As expected, included participants (M = 3.62, SD = 1.06) reported feeling significantly more included than excluded participants (M = 1.60, SD = 0.97), t(65) = −8.05, p < .001, d = 1.99. Given this large effect, we can be confident that the exclusion manipulation worked as intended.

To confirm that the control intervention involving comics was just as enjoyable as the experimental intervention involving Facebook, we ran an independent samples t-test on participants’ ratings of enjoyment. Participants reported that browsing Facebook (M = 3.09, SD = 0.62) and the comics website (M = 3.09, SD = 0.46) were similarly enjoyable, t(65) = .02, p = .98, d < .01. Given this similarity, we cannot attribute the effectiveness of either intervention to its enjoyment.

Also, to determine whether participants spent the 4 min provided passively viewing photos on Facebook (as in Study 3) or whether they engaged in other tasks, we examined participants’ open-ended reports of their Facebook activity. These exploratory data revealed that only 9% of the sample spent the entire time looking at photos. Most participants were quite active users: 82% engaged in two or more Facebook activities and 68% communicated with friends through one or more means (e.g., message replies, wall postings, Facebook chat, photos commentary). These data confirm that most participants actively used Facebook during the time allotted.

To test our primary hypothesis, we ran a 2 (Cyberball: included vs. excluded) × 2 (website browsed: Facebook vs. comics) between-subjects ANOVA on the aggression index (M = 4.19, SD = 1.78). It yielded no effects of website, F(1, 63) = .11, p = .740, ηp² < .01, or Cyberball condition, F(1, 63) = .03, p = .853, ηp² < .01. However, a significant crossover interaction emerged, F(1, 63) = 5.72, p = .020, ηp² = .08, as shown in Figure 4. Subsequent analyses revealed that excluded participants were marginally more aggressive than included participants if they had browsed comics, F(1, 63) = 3.28, p = .075, ηp² = .05. Conversely, excluded participants were somewhat less aggressive than included participants if they had browsed Facebook, F(1, 63) = 2.47, p = .121, ηp² = .04. Thus,

Results and Discussion

Prior to data analysis, we needed to eliminate six participants who were highly suspicious of either Cyberball or the CRT task, one participant who rushed through the study (as indicated by rapid, identical responses to questions), and one participant who reported feeling awkward and uncomfortable browsing her Facebook page in the presence of the experimenter. One other participant was dropped because of computer malfunction.

First, we ran an independent samples t-test on participants’ feelings of inclusion in Cyberball. As expected, included participants (M = 3.62, SD = 1.06) reported feeling significantly more included than excluded participants (M = 1.60, SD = 0.97), t(65) = −8.05, p < .001, d = 1.99.

![Figure 4. Aggression on the noise blast game as a function of Cyberball condition and exposure to Facebook or a comics website. Error bars indicate ±1 SE.](http://www.example.com)
Cyberball seemed to have opposite, weak effects (accounting for 4–5% of variance in aggression) among participants who read online comics versus those who browsed Facebook. The remaining tests of simple effects revealed a marginal effect of website among excluded participants, $F(1, 63) = 3.36, p = .071, \eta^2_p = .05$, such that participants who browsed Facebook demonstrated less aggression than those who read comics, and a trend among included participants, $F(1, 63) = 2.37, p = .129, \eta^2_p = .04$, such that participants who browsed Facebook demonstrated somewhat more aggression than those who read comics. These tests suggest that the websites produced weak, differential effects (again, accounting for 4–5% of the variance) among participants who were included versus those who were excluded in Cyberball.

Consistent with expectations, excluded participants were more aggressive than included participants, if they had passed time on the enjoyable, but nonsocial comics website. These findings jibe with past studies showing that exclusion increases aggression (Twenge et al., 2001) and relationship reminders can mitigate exclusion-induced aggression (Twenge et al., 2007), although this effect was marginal in our study. The relatively weak effect may be attributable to participants playing with a new person rather than an exclusive Cyberball player. More importantly, exposure to Facebook appeared to wipe out this pattern of aggression altogether. In fact, participants who spent a few minutes on Facebook after exclusion were less aggressive than those who had done so after inclusion. This reversal reveals that Facebook has the potential to do some harm after inclusion. Having engaged in affiliative behavior during Cyberball, included participants who browsed Facebook may have experienced a sense of overinclusion that, in turn, motivated antisocial behavior on the CRT task. In other words, Facebook users may have felt a greater need for distinctiveness than affiliation after inclusion, and as a result, they may have displayed antisocial tendencies. Such a balancing of assimilation and differentiation needs is consistent with Optimal Distinctiveness Theory (Brewer, 1991).

General Discussion

The current investigation revealed that belonging needs motivate SNS use and SNSs serve a restorative function after exclusion. Participants in Study 1 spontaneously engaged in more computer-mediated communication via email, SNSs, and texting after exclusion than inclusion, suggesting that acute threats to one’s belonging motivate social behavior online. Examining SNS use specifically, Study 2 demonstrated that individuals with chronically high belonging needs use Facebook more frequently and are more likely to befriend strangers on Facebook than those with lower belonging needs. Moreover, extroverts and socially anxious individuals may be particularly likely to use Facebook in the service of their belonging needs. Studies 3 and 4 demonstrated that exposure to Facebook following exclusion helps to restore individuals’ fundamental social needs and mitigate the aggressive tendencies typically found after exclusion.

The current findings linking belonging needs to computer-mediated communication and SNS use are consistent with research linking feelings of disconnection and loneliness to Facebook use (Kross et al., 2013; Sheldon et al., 2011). The current studies extend this work by examining both dispositional differences in chronic belonging needs as well as situational threats to belonging. The experimental data from Study 1 provide evidence that a single exclusion experience in a controlled laboratory setting is sufficient to demonstrate behavioral preferences for computer-mediated communication and SNS use. Unlike much of the relevant work on internet and SNS use (e.g., Gangadharbhatla, 2008), Study 1 relied on observational methods rather than self-reports, which are susceptible to memory biases and demand characteristics. Furthermore, Study 2 demonstrated that belonging needs motivate Facebook activity above and beyond other factors such as extroversion and social anxiety.

As the debate about the costs and benefits of Facebook continues (Wilson, Gosling, & Graham, 2012), most (but not all) of our findings from Studies 3 and 4 strengthen and refine arguments in support of Facebook use. While others have found that Facebook generally increases users’ feelings of connection (Sheldon et al., 2011), we found that Facebook benefits those under social threat, in particular. That is, exposure to Facebook did not boost our participants’ need satisfaction scores across the board; instead, it protected the needs of those who had experienced exclusion. Moreover, our third study examined a previously untested assumption. Specifically, Knauenberger et al. (2015) assumed that their Facebook prime had replenished excluded participants’ social needs given their disinterest in future social contact. Our findings confirmed that assumption by examining participants’ needs directly. Also, the current investigation was the first to demonstrate that actually getting on Facebook does not exacerbate social threat or worsen individuals’ mood; instead, exposure to one’s Facebook page replenishes social needs and mitigates the negative consequences of exclusion.

Limitations and Future Directions

The current findings suggest that Facebook benefits the excluded, but the factors driving this ameliorative effect are unclear. Because the Facebook manipulation in Study 4 more effectively neutralized the social threat than the manipulation in Study 3, we might conclude that self-directed activity on Facebook is more restorative than browsing one’s photos on Facebook. This pattern of findings is consistent with previous research showing that active Facebook use (e.g., leaving posts on others’ walls, messaging friends, updating one’s status) is more likely to relieve one’s loneliness than passive Facebook use (e.g., reading one’s News Feed, viewing others’ pages, browsing photos; Burke et al., 2010; Deters & Mehl, 2012).
Yet, previous research demonstrates that concrete social reminders like photographs can protect individuals from rejection-induced drops in self-esteem (Gardner et al., 2005). The digital photos we used in Study 3 likely differed from the physical photos of friends used in prior research because we did not control the content of participants’ Facebook photos. Moreover, some Facebook photos may have elicited no comments or “likes” from friends—making some participants feel disliked and disconnected (Greitemeyer et al., 2014). Consequently, browsing one’s Facebook photos may be socially restorative for some individuals, but not all. Future studies could code the content of and responses to individuals’ Facebook photos to determine which characteristics make Facebook photos socially restorative.

Because the current studies were conducted with undergraduates primarily, we cannot conclude with certainty that Facebook would benefit users universally. For instance, new Facebook users may not reap the same benefits as college students who are likely more seasoned Facebook users with extensive social networks (McAndrew & Jeong, 2012). Such a discrepant outcome would echo some of the earliest findings on internet use. Kraut and colleagues (1998, 2002) found that new internet users reported increases in loneliness initially, but later use in subsequent years was no longer associated with loneliness. Consequently, we might expect the social benefits of Facebook to grow as one’s experience with and connections on Facebook grow. Future research should examine this question and replicate the current studies with more diverse samples.

On a related note, Studies 1 and 2 provide initial evidence that threatened belonging needs increase Facebook use and other means of computer-mediated communication, but alternative explanations remain. For instance, we are unable to distinguish social threats from ego threats in Study 1; perhaps a nonsocial ego threat (e.g., failure) would also elicit social behavior. Ideally, Study 1 would be replicated with a nonsocial ego threat as a control condition, but such a replication would not be revelatory if ego threats also threaten one’s belonging needs, as suggested by Sosiometer Theory (Leary et al., 1995). If that Gordian knot persists, perhaps an alternative solution would be to assess mood, self-esteem, control, and additional factors to determine their influence. Moreover, future research is needed to assess the mechanisms underlying the effects revealed in Study 4. We imagine that Facebook mitigates the negative consequences of exclusion by restoring individuals’ sense of belonging, but additional research is needed to assess the mediating role of belonging needs.

Finally, many of the studies reported in the current investigation rely upon small samples that lack sufficient power to test higher order interactions, such as the potential three-way interaction in Study 2. Moreover, suspicion and technical problems required us to eliminate some participants in Study 4, which further reduced our sample size. Given these concerns with individual studies, one might focus on the pattern of findings that emerged across all four studies. This pattern suggests that social media such as Facebook serves as a social resource for individuals coping with threats to their belonging needs.

Conclusions

Being ignored, excluded, or rejected threatens our belonging needs and spurs efforts to reconnect with others (Baumeister & Leary, 1995; Maner et al., 2007). Fortunately, technology makes this easier than ever. If we are unable or unwilling to connect with others face-to-face in order to assuage our belonging needs, we can take advantage of computer-mediated communication, as participants did in our first study. People with a particularly strong desire for social acceptance and belonging can satisfy their ample social appetites by frequenting SNSs like Facebook and befriending others with a simple click of a button. We don’t have to extract curled portraits of family members from our wallets or extract shoeboxes of old letters from our closets to replenish our social stores and mitigate the negative consequences of exclusion. Instead, we can open an application on our phone or tablet and log on to Facebook to reaffirm our social bonds anywhere and anytime—making Facebook one powerful tool.

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Megan L. Knowles
Franklin & Marshall College
Department of Psychology
P.O. Box 3003
Lancaster, PA 17604
USA
Tel. +1 717 358-4556
E-mail megan.knowles@fandm.edu