

Facebook undermines the social belonging of first year students



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ARTICLE INFO

Article history:

Received 12 December 2016

Received in revised form 4 March 2017

Accepted 16 March 2017

Available online 22 March 2017

Keywords:

Facebook

Well-being

Social comparisons

Belonging

Social connection

ABSTRACT

We examined whether an online social networking technology (Facebook) influenced students' perceptions of their peers' social connections as well as their own feelings of belonging. In this experiment ($N = 601$), students were assigned to view Facebook profiles with high or low social content. Students then estimated the number of friends their peers had and self-reported their own feelings of belonging and intentions to socialize with other students. Overall, there were no between-condition differences on these measures. However, first-year students responded differently than other students: they expressed reduced feelings of belonging after viewing the Facebook profile with high (vs. low) social content, whereas students from other years expressed marginally higher feelings of belonging after viewing the Facebook profile with high (vs. low) social content. These findings suggest that people who are new to a social network may be particularly susceptible to negative impacts of Facebook.

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1. Introduction

Facebook is the most commonly visited website worldwide, and on average, Americans spend 56 billion min on Facebook each month (Facebook Newsroom, 2016). Given the popularity of this social media platform, it is critically important to understand how this social networking site impacts social connection and social integration. In this paper, we examine the role of Facebook in shaping the belonging of students who are new to their social network.

Multiple studies have linked Facebook to users' experience of well-being and belonging. Interestingly, this growing body of research has found evidence that Facebook use has both positive (Ellison, Steinfield, & Lampe, 2007; Gonzales & Hancock, 2011; Hobbs, Burke, Christakis, & Fowler, 2016; Kim & Lee, 2011) and negative (Fardouly, Diedrichs, Vartanian, & Halliwell, 2015; Kross et al., 2013; Kramer, Guillory, & Hancock, 2014; Lin & Utz, 2015) associations with users' well-being.

Given these discrepant findings, research has started to shift its focus towards identifying the personal characteristics that explain whether and when Facebook use enhances versus undermines well-being (e.g., Simoncic, Kuhlman, Vargas, Houchins, & Lopez-Duran, 2014). For example, in a recent meta-analysis of thirty studies, researchers documented the role of depression in understanding the link between Facebook use and well-being. In this meta-analysis, there was a weak, positive

relationship between depression symptoms and Facebook use (Baker & Algorta, 2016). However, the authors of this paper also called for more research examining other potential moderators. Given that most of the research on this topic has been correlational, open questions remain about when and for whom Facebook use has causal downstream implications for subjective well-being.

Building on this emerging body of research, we conducted an experiment to examine the causal impact of Facebook consumption on users' perceptions of their peers' social networks, their own feelings of belonging, and their social intentions. We also examined whether the social and emotional effects of viewing other people's Facebook pages were contingent on the personal characteristics of the user. Specifically, we examined whether Facebook was more impactful for students' social perceptions and belonging when students were new to their social network.

We hypothesized that students who were new to university would be more impacted by peers' information on Facebook, given that they should be more likely to feel uncertain about their place in their new social network. Prior theorizing and research suggests that people who are faced with a new or uncertain situation are more likely to engage in social comparisons with their peers (Festinger, 1954; Taylor, Buunk, & Aspinwall, 1990; Garcia, Tor, & Schiff, 2013 for a review). Research also suggests in making the transition to college, many students feel uncertain about whether they belong in their new university setting, with negative implications for well-being and physical health (e.g., Walton & Cohen, 2011; Yeager, Romero, Paunesku, Hulleman, et al., 2016). Consequently, individuals who are new to their social network might be more likely to compare themselves with others in their network when

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passively viewing peers' Facebook profiles, which could negatively affect their feelings of belonging (Gonzales & Hancock, 2011).

To test these hypotheses, we conducted an experimental study with university students. In this study, we randomly assigned students to view either highly social Facebook profiles, or less social Facebook profiles from their peers at the same university. Students were then asked to estimate how many friends they thought their peers had on campus, how much time their peers spent socializing in an average week, and to report on their own belonging, and intentions to socialize. We predicted that any negative effect of viewing highly social Facebook profiles on belonging or intentions to socialize would be moderated by whether students were new to their social network. We also measured students' feelings of social self-efficacy and extraversion. We included these measures based on previous research suggesting that these variables may serve as moderators of the impact of Facebook use on well-being (Wei, Russell, & Zakalik, 2005; Williams, 2007).

The typical Facebook user spends most of his or her time on Facebook passively observing without posting or "lurking" (Pempek, Yermolayeva, & Calvert, 2009). It is therefore important to understand how these behaviors influence users' well-being. In a recent study, self-reported passive Facebook use was negatively related to well-being (W. Chen, Fan, Liu, Zhou, & Xie, 2016). However, this study did not identify the causal effects of passive Facebook use on well-being. Thus, in our study, we chose to focus on the role of passive Facebook consumption on users' well-being.

2. Methods

2.1. Participants

Six-hundred-and-one undergraduate students (71.2% female; $M_{age} = 19.92$, $SD = 2.17$) at The University of British Columbia (UBC) volunteered to participate for course credit. Participants were recruited in the first semester of the year, thereby ensuring that the first-year students who participated were new to their social environment (Pittman & Richmond, 2008).

3. Methods

3.1. Facebook profiles

To maximize external validity, we developed our stimuli using the actual profiles of two male and two female students who had provided consent for our team to use their Facebook profiles for this experiment. The students featured in these vignettes were second, third, and fourth year students from UBC (information about these students' upperclassman status was not presented to our study participants). To maximize internal validity, we edited the information that these students provided to us, selectively presenting elements of their Facebook profiles to control for the number of posts presented, the types of posts featured, and other social information such as the number of likes and comments that other students made on each post.

Each adapted Facebook profile consisted of a banner containing the student's profile photo, a cover photo, and four selected posts with the likes and comments removed. The Facebook profile stimuli and data for this study are available through the Open Science Framework (osf.io/nxsnf). To control for the overall length of the Facebook profile and the amount of visual information available, all posts were photos or shared links. To control for content differences depending on who was responsible for making the post, each profile featured two posts that were uploaded by the profile owner and two posts that were uploaded to the wall by the participants' friends. To preserve confidentiality, any faces or names other than the profile owners' face were blurred out.

We created a high social content version and a low social content version of each individual profile (i.e., two versions were developed from each man or woman's original profile). High social content posts

were selected for the first version of the profile on the basis of (a) outlining a social activity and (b) having at least one friend tagged or portrayed. In contrast, low social content posts were selected for the second version of the profile on the basis of (a) minimizing the social content of the posts and (b) minimizing the number of friends tagged or portrayed. The direct contrast between these two types of Facebook profiles allowed us to draw causal conclusions about the effect of social Facebook content on students' social perceptions, intentions, and belonging. We chose to manipulate the content of the Facebook profiles (vs. number of friends) because this information is typically most salient to users when they are passively viewing others' profiles.

3.2. Procedure

Each participant completed the 30-minute study using a computer in a quiet laboratory room. Participants first completed several questions about their own social networks. Students were asked how many close friends they had at UBC, and how many social acquaintances they had at UBC. Students were also asked to report the percentage of time that they had spent socializing with UBC students, with non-UBC students, and alone over the last seven days. These questions were adapted from past research investigating first-year students' social perceptions and social habits (Whillans, Christie, Cheung, Jordan, & Chen, 2016). To control for students' overall feelings of belonging at UBC, participants completed two items adapted from the UCLA Loneliness Scale (Russell, 1996). Specifically, participants reported their agreement with the items "I belong at UBC" and "People at UBC accept me" on a scale ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). Reliability of this measure was acceptable ($\alpha = 0.68$).

After completing these measures, participants were randomly assigned to the High Social or Low Social Facebook profile conditions. To reduce possible carryover effects, participants completed an unrelated reading comprehension filler task before and after viewing two of the four Facebook profiles. Participants were asked to take their time when viewing the profiles and were told that they would have to answer questions about these profiles. On average, students spent approx. 1.5 min viewing the Facebook profiles ($M = 92.28$, $SD = 32.51$).

After participants viewed the Facebook profiles, they completed a similar set of questions about their peers. Participants were asked to report how many close friends and how many social acquaintances they thought that the typical UBC student had at UBC. Students were also asked to estimate the percentage of time the typical UBC student spent socializing with UBC students, non-UBC students, and alone, over the last seven days. This set of questions was used to assess participants' perceptions of the social connectedness of their peers.

Next, participants completed validated measures to assess their belonging and intentions to socialize. First, participants reported their current feelings of belonging at UBC using the 8-item Sense of Community Scale (Davidson & Cotter, 1986). This scale was originally developed to assess community within a city. Consistent with past research (Sandstrom & Dunn, 2014), we adapted this measure to assess students' belonging at UBC. Using this measure, participants rated their agreement with statements including "I feel like I belong here" on a scale ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). Reliability was acceptable ($\alpha = 0.72$).

Next, participants reported their intentions to socialize with other UBC students using a 12-item social intentions measure (Maner, DeWall, Baumeister, & Schaller, 2007). Participants completed a questionnaire about a student service that was being considered at [institution]. Participants read a short paragraph about the student service and reported the degree to which they would be interested in using this service to make new friends. Responses were recorded using scales ranging from 1 (*Strongly disagree*) to 12 (*Strongly agree*). These items were averaged to create a composite measure of participants' desire to connect with other students. Reliability was excellent ($\alpha = 0.94$).

Participants then completed a 12-item social self-efficacy scale (Smith & Betz, 2000; $\alpha = 0.82$) and a 10-item extraversion scale from the Big Five Inventory (Goldberg, 1992; $\alpha = 0.86$).

Finally, participants were asked to consider the students whose profiles they viewed previously all together, and to rate how (1) likeable, (2) similar to themselves, (3) socially connected, and (4) physically attractive they were. The third item was the focal manipulation check question. It was included to ensure that the profiles portrayed in the high social content condition were rated as more social than those in the low social content condition by participants.

Full scale items are available through the Open Science Framework (osf.io/nxsnf).

4. Results

4.1. Manipulation check

As expected, profile owners were rated as significantly more socially connected in the High Social condition ($M = 6.17$, $SD = 1.00$) than in the Low Social condition ($M = 5.56$, $SD = 1.04$), $F(1, 600) = 53.50$, $p < 0.001$ (See Table 1). Controlling for perceived likability, attractiveness, and similarity of the Facebook profile owners to the participants yielded similar results, $F(4, 600) = 50.61$, $p < 0.001$. Thus, the students featured in the social profiles were perceived as more socially connected than the students featured in the non-social profiles, and these results held controlling for other differences that may have existed in the two conditions.

4.2. Moderation analyses

4.2.1. First-year student status

We assessed whether students who were new to the social network responded differently to the highly-social Facebook profiles than students who were more familiar with the social network. To examine this possibility, we conducted analyses to examine whether first-year student status moderated any effects of condition on (a) students' perception of their peers' social networks (b) students' feelings of belonging after viewing the Facebook profiles and (c) students' intention to socialize. In this study, 27.6% of the students in our sample ($N = 166$) were first-year university students, and this proportion did not significantly differ by condition ($p = 0.316$). Importantly, first year students did not differ from other participants on demographic and personality variables that may otherwise explain our results including extraversion, social self-efficacy, T1 belonging, gender, or ethnicity ($ps \geq 0.66$).

First-year students' perceptions of their peers' social networks and of their peers' time spent socializing, as well as their own social intentions, were not impacted by condition assignment (SOM). However, there was a significant interaction between first year student status and condition to predict students' feelings of belonging, $F(1, 596) = 11.52$, $p < 0.001$ (Fig. 1).

We then conducted moderation analyses with 10,000 bootstrapped samples (Preacher & Hayes, 2004). Controlling for T1 belonging, after viewing the highly social vs. the less social Facebook posts, first-year students reported significantly lower T2 belonging, $B = 0.23$

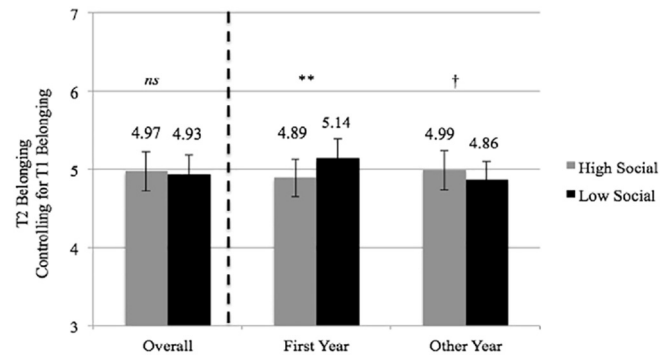


Fig. 1. T2 belonging by first year student status. † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

(0.08), $p = 0.004$, 95%CI $[-0.39, -0.08]$. There was a non-significant effect of viewing the highly social Facebook posts for non-first year students, $B = 0.08$ (0.05), $p = 0.083$, 95%CI $[-0.01, 0.18]$.¹

This pattern of results held controlling for age. Controlling for age, there was a significant interaction between first year student status and condition to predict T2 belonging, $F(1, 595) = 11.48$, $p = 0.0008$. Upon conducting moderation analyses with 10,000 bootstrapped samples, and controlling for age and T1 belonging, first year students exhibited significantly lower levels of T2 belonging, $B = -0.23$ (0.08), $p = 0.0043$ $[-0.38, -0.07]$. Once again, there was a non-significant effect of the highly social Facebook posts among non-first year students, $B = 0.09$ (0.05), $p = 0.072$ $[-0.01, 0.18]$. These results provide suggestive evidence that non-first year students may have felt greater belonging after viewing the highly social profiles, although this was result was not statistically significant and should be interpreted cautiously.

4.2.2. Social self-efficacy and extraversion

We found no evidence that social self-efficacy or extraversion influenced students' reactions to condition assignment (SOM).

4.2.3. Main effect of condition

There also was no main effect of condition on any of the key outcomes measured. See SOM for the results reported on each measure separately.

5. Discussion

Overall, students who viewed the highly social profiles did not experience reduced feelings of belonging or reduced intentions to socialize compared to students who viewed less social profiles. These results suggest that the students that we studied were relatively resilient to the varying levels of social content contained in Facebook profiles presented to them.

In this experiment, an interesting pattern emerged whereby first-year students, who were new to their social network at university, were the most impacted by the Facebook profiles of other university students. First year students reported lower belonging on campus after viewing the highly social Facebook profiles from their peers. These findings dovetail with recent meta-analytic work suggesting that are critical moderators of the effects of social media on well-being. These findings may help to reconcile conflicting findings showing that Facebook use is both positively and negatively related to well-being. Indeed, these findings leave open the possibility that whether individuals are new to their social network is an overlooked moderator.

¹ These results were statistically consistent when we used year university as a continuous predictor and examined the impact of a condition X year of university to predict T2 belonging, $\beta = -0.14$, $p = 0.012$. This interaction indicates that students who were newer to the social environment experienced lower feelings of belonging in response to the highly social profiles.

Table 1
Manipulation check questions by condition.

Variable	Condition		<i>f</i>	<i>p</i>	<i>df</i>
	High social content	Low social content			
Socially connected	6.17 (1.00)	5.56 (1.04)	53.50	<0.001	600
Likeable	5.65 (0.84)	5.47 (0.88)	6.97	0.008	600
Similar	3.70 (1.49)	3.91 (1.45)	3.08	0.080	600
Physically attractive	4.51 (1.19)	4.46 (1.12)	0.300	0.584	600

Interestingly, viewing highly social profiles marginally improved the belonging of non-first year students. Because these results were not statistically significant, more research is needed to clarify whether the highly social profiles causally improved belonging for non-first year students.

Students' initial feelings of belonging at T1 and their social network size did not interact with condition to predict T2 belonging. It is possible, however, that our sample did not contain many students who felt lonely or socially anxious. Consistent with this proposition, over 90% of our sample scored above the mid-point on T1 UBC belonging. Therefore, future research should selectively recruit students who feel lonely to examine whether baseline feelings of connection predict students' reactions to highly social Facebook profiles.

Relatedly, we asked participants about their belonging at UBC prior to viewing the Facebook profiles. Although we included a filler task, we cannot rule out the possibility that we inadvertently made students' UBC belonging salient prior to viewing the profiles. Future research should assess students' belonging several days prior to viewing the Facebook profiles to rule out the possibility that saliency of one's own belonging drove our observed results.

Because we constrained the Facebook content, future research should also examine how the content of the profiles impacts students' belonging. It is likely that our study provided a conservative test of the effect of social information on the belonging of first year students, because the students in the study did not know the individuals featured in the profiles. Future research could therefore examine whether Facebook information differentially impacts feelings of belonging depending on students' familiarity with the individuals featured in the profiles.

Given the null results that we observed, more research is needed to replicate and extend our current work. Yet, these findings point to the importance of examining the impact of social media using large, diverse samples and experimental designs. This research has the potential to go beyond broad generalizations about correlates of social media use and establish more nuanced causal relationships between social media use and well-being for specific individuals under specific circumstances. In sum, this work provides a springboard for research examining how being new to a social network may shape the consequences of social media consumption.

Acknowledgements

This research was supported by a Canadian Social Sciences and Humanities Research Council grant (430-2015-00412) to F.S.C. as well as a Canadian Social Sciences and Humanities Research Council doctoral fellowship awarded to A.W. The authors would like to thank Dylan Meng, Iris Lok, and Monica Vuong for their assistance with data collection and management.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.paid.2017.03.043>.

References

Baker, D. A., & Algorta, G. P. (2016). The relationship between online social networking and depression: A systematic review of quantitative studies. *Cyberpsychology, Behavior and Social Networking*, *19*(11), 638–648.

- Chen, W., Fan, C. Y., Liu, Q. X., Zhou, Z. K., & Xie, X. C. (2016). Passive social network site use and subjective well-being: A moderated mediation model. *Computers in Human Behavior*, *64*, 507–514.
- Davidson, W. B., & Cotter, P. R. (1986). Measurement of sense of community within the sphere of city. *Journal of Applied Social Psychology*, *16*(7), 608–619.
- Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends": social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication*, *12*(4), 1143–1168.
- Facebook Newsroom (2016). Facebook Company information. Retrieved from <http://newsroom.fb.com/company-info/>
- Fardouly, J., Diedrichs, P. C., Vartanian, L. R., & Halliwell, E. (2015). Social comparisons on social media: The impact of Facebook on young women's body image concerns and mood. *Body Image*, *13*, 38–45.
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations; Studies Towards the Integration of the Social Sciences*, *7*(2), 117–140.
- Garcia, S. M., Tor, A., & Schiff, T. M. (2013). The psychology of competition a social comparison perspective. *Perspectives on Psychological Science*, *8*(6), 634–650.
- Goldberg, L. R. (1992). The development of markers for the Big-Five factor structure. *Psychological Assessment*, *4*(1), 26.
- Gonzales, A. L., & Hancock, J. T. (2011). Mirror, mirror on my Facebook wall: Effects of exposure to Facebook on self-esteem. *Cyberpsychology, Behavior and Social Networking*, *14*(1–2), 79–83.
- Hobbs, W. R., Burke, M., Christakis, N. A., & Fowler, J. H. (2016). Online social integration is associated with reduced mortality risk. *Proceedings of the National Academy of Sciences* (pp. 201605554).
- Kim, J., & Lee, J. E. R. (2011). The Facebook paths to happiness: Effects of the number of Facebook friends and self-presentation on subjective well-being. *Cyber Psychology, Behavior, and Social Networking*, *14*(6), 359–364.
- Kramer, A. D., Guillory, J. E., & Hancock, J. T. (2014). Experimental evidence of massive-scale emotional contagion through social networks. *Proceedings of the National Academy of Sciences*, *111*(24), 8788–8790.
- Kross, E., Verduyn, P., Demiralp, E., Park, J., Lee, D. S., Lin, N., & Ybarra, O. (2013). Facebook use predicts declines in subjective well-being in young adults. *PLoS One*, *8*(8), e69841.
- Lin, R., & Utz, S. (2015). The emotional responses of browsing Facebook: Happiness, envy, and the role of tie strength. *Computers in Human Behavior*, *52*, 29–38.
- Maner, J. K., DeWall, C. N., Baumeister, R. F., & Schaller, M. (2007). Does social exclusion motivate interpersonal reconnection? Resolving the "porcupine problem". *Journal of Personality and Social Psychology*, *92*(1), 42.
- Pempek, T. A., Yermolayeva, Y. A., & Calvert, S. L. (2009). College students' social networking experiences on Facebook. *Journal of Developmental Psychology*, *30*(3), 227–238.
- Pittman, L. D., & Richmond, A. (2008). University belonging, friendship quality, and psychological adjustment during the transition to college. *Journal of Experimental Education*, *76*(4), 343–362.
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, *36*(4), 717–731.
- Russell, D. W. (1996). UCLA loneliness scale (version 3): Reliability, validity, and factor structure. *Journal of Personality Assessment*, *66*(1), 20–40.
- Sandstrom, G. M., & Dunn, E. W. (2014). Social interactions and well-being: The surprising power of weak ties. *Personality and Social Psychology Bulletin*, *40*(7), 910–922.
- Simoncic, T. E., Kuhlman, K. R., Vargas, I., Houchins, S., & Lopez-Duran, N. L. (2014). Facebook use and depressive symptomatology: Investigating the role of neuroticism and extraversion in youth. *Computers in Human Behavior*, *40*, 1–5.
- Smith, H. M., & Betz, N. E. (2000). Development and validation of a scale of perceived social self-efficacy. *Journal of Career Assessment*, *8*(3), 283–301.
- Taylor, S. E., Buunk, B. P., & Aspinwall, L. G. (1990). Social comparison, stress, and coping. *Personality and Social Psychology Bulletin*, *16*(1), 74–89.
- Walton, G. M., & Cohen, G. L. (2011). A brief social-belonging intervention improves academic and health outcomes of minority students. *Science*, *331*(6023), 1447–1451.
- Wei, M., Russell, D. W., & Zakalik, R. A. (2005). Adult attachment, social self-efficacy, self-disclosure, loneliness, and subsequent depression for freshman college students: A longitudinal study. *Journal of Counseling Psychology*, *52*(4), 602.
- Whillans, A. V., Christie, C., Cheung, S., Jordan, A., & Chen, F. (2016). *Social overestimations undermine well-being*. Working Paper: The University of British Columbia.
- Williams, D. (2007). The impact of time online: Social capital and cyberbalkanization. *Cyber Psychology & Behavior*, *10*(3), 398–406.
- Yeager, D. S., Romero, C., Paunesku, D., Hulleman, C. S., ... Trott, J. (2016). Using design thinking to improve psychological interventions: The case of the growth mindset during the transition to high school. *Journal of Educational Psychology*, *108*(3), 374.