

Facebook Friends with (Health) Benefits? Exploring Social Network Site Use and Perceptions of Social Support, Stress, and Well-Being

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Abstract

There is clear evidence that interpersonal social support impacts stress levels and, in turn, degree of physical illness and psychological well-being. This study examines whether mediated social networks serve the same palliative function. A survey of 401 undergraduate Facebook users revealed that, as predicted, number of Facebook friends associated with stronger perceptions of social support, which in turn associated with reduced stress, and in turn less physical illness and greater well-being. This effect was minimized when interpersonal network size was taken into consideration. However, for those who have experienced many objective life stressors, the number of Facebook friends emerged as the stronger predictor of perceived social support. The “more-friends-the-better” heuristic is proposed as the most likely explanation for these findings.

Introduction

RESEARCH DEMONSTRATES THAT psychological stress is inversely associated with physical and psychological well-being.¹ However, perceived social support, or the perception that social relationships could provide needed emotional and instrumental resources,² can be a powerful moderating factor in this relationship. Indeed, the social support literature has emphasized how integration into interpersonal networks may contribute to greater perceptions of available resources. However, given the meteoric rise in the use of social networking sites (SNSs), such as Facebook and MySpace, the scope of possible perceived social support resources has widened dramatically. Yet, it is unclear whether integration into mediated friend networks has the same palliative effects as more direct interpersonal networks. This research contributes uniquely to the existing literature by investigating the role SNS use plays in the dynamic among perceived social support, perceived stress, and both physical and psychological well-being.

Online SNSs, social support, and well-being

By late 2011, SNSs reached 1.2 billion users worldwide, or 82% of the world's online population.³ This growth has been driven by Facebook, which now boasts more than 800 million members,⁴ and accounts for about 75% of time spent on SNSs

and 1 in every 7 minutes spent online.³ Despite the wealth of research on Facebook (see Wilson et al.⁵ for a recent review), very little research examines the relationships among Facebook use, social support, and well-being. Of the research that has investigated social support, the extant studies focus on how Facebook and related platforms provide opportunities for social support seeking and provision,^{6,7} though they do not typically extend their inquiry to mental and physical health outcomes.

The few studies that have examined psychological well-being as a function of Facebook use have yielded mixed results. For example, Sundar et al.⁸ found that Facebook use frequency did not associate with life satisfaction, whereas Kontos et al.⁹ found that SNS users reported greater psychological distress than nonusers did. However, neither study considered the role of social support and both focused on use frequency rather than on the network size itself.

Research that has considered the relationships among Facebook network size, perceived social support, and psychological health supports a positive relationship between number of Facebook friends and perceived well-being.^{10,11} However, the role of social support is still unclear. Manago et al.¹⁰ found a relationship between network size and perceived social support, but they did not consider the latter's relationship to perceived stress. Kim and Lee¹¹ did examine the meditational role of perceived social support, but did not, as expected, find it to influence the network size-perceived

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well-being relationship, though other evidence suggests that perceived emotional support from a single Facebook friend may associate with lower perceived stress.¹² Thus, though the literature hints at a dynamic among Facebook network size, perceived social support, and psychological well-being, the nature of these relationships is still unclear.

As to possible physical effects of Facebook use, though the literature to date has suggested Facebook as a promising channel for health promotion¹³ and has explored Facebook use by physicians¹⁴ and patients,¹⁵ no extant research has examined the relationship between any Facebook use variable and physical health outcomes. The paucity of research examining how SNS use links to physical and psychological well-being is somewhat surprising given the extensive research linking social support to health outcomes.¹ Given the unprecedented ability of SNSs to enhance the salience and visibility of one's social network, affording greater opportunity for perceiving social support, and given recent psychophysiological evidence that Facebook use associates with a positive core flow state,¹⁶ it is both important and relevant to inquire how that perceived social support might translate into health benefits for users. For this, we turn to the concept of psychological stress.

Theorizing the relationships among social support, psychological stress, and well-being

Psychological stress refers to the disequilibrium that results when people perceive that they lack the resources necessary to meet the demands placed on them within their environments.^{17,18} Importantly, according to the cognitive-phenomenological theory of stress,¹⁹ it is the perception of the potential stressor based on goal-relevant appraisals (e.g., event significance, resources available)—not the objective environmental conditions themselves—that predict both levels of psychological stress as well as people's ability to manage and adapt to their extant circumstances.

Extensive research demonstrates that psychological stress inversely associates with physical health and psychological well-being.¹ Further, there is extensive evidence that social support—both instrumental and emotional—can help reduce feelings of stress, thus minimizing its negative physical effects.^{1,20} This palliative impact of social support has been explained by two models. The main effects model proposes that social support has a direct effect on health such that strong social support networks and satisfactory social support enhance health and well-being by minimizing stress, whereas weak social networks and a lack of social support act as stressors that have deleterious health effects.²¹ Alternatively, the buffering hypothesis proposes that those with greater levels of social support enjoy greater health and well-being than those with comparatively poor social support when facing stressful life events or under conditions of greater stress.^{22,23} Specifically, those with stronger social support networks may perceive the availability of more coping resources in times of high stress, which decreases the likelihood that stressful events will be interpreted as threats. These support beliefs may also dampen any negative affect associated with stressful life events as well as influence adaptive behavior.²⁴

Largely through the lens of the main effects model, researchers have found strong evidence for the health benefits

of social integration.^{25–31} In contrast, support for the buffering hypothesis has been mixed,^{32,33} arguably because of variance in how social support has been operationalized.³⁴ Still, research shows that perceived support, or the belief that support is available if needed, is a particularly strong shield against the injuries of stress on well-being.³⁵

To the extent that SNSs either replace or augment more direct social contact, understanding whether or not online friendships alter the health benefits of more direct social contact is of great social relevance, especially given the massive diffusion of SNS use. This study attempts to bridge the gap between the interpersonal social support and health literature and the nascent body of literature on the health effects of SNS use by examining whether Facebook friendships are associated with physical and psychological health benefits via perceptions of social support and stress.

If those with more Facebook friends perceive themselves to have a broad social network, they will likely perceive themselves to have at their disposal a wealth of potential social support, regardless of actual support provided. As the perception of social support availability should increase the perception of resources available to meet life's demands, perceived stress should be reduced and negative health impacts minimized. Thus, we predict that number of Facebook friends will indirectly affect physical health by increasing perceived social support and reducing perceived stress (Hypothesis 1 [H1]).

Although Kim and Lee¹¹ found that number of Facebook friends associates with psychological well-being, they did not find that relationship to be mediated by perceived social support. However, we posit that perceived social support will prove central if we also consider perceived stress as a moderator. Thus, we predict that number of Facebook friends will indirectly benefit psychological health by increasing perceived social support and reducing perceived stress (Hypothesis 2 [H2]).

Given the overlap between Facebook friends and friends in the real world, it is important to consider how any relationships found among these constructs fare in light of controlling for interpersonal social support networks. We expect that interpersonal social support will have a stronger relationship to these variables. Our primary question, though, is whether Facebook networks will maintain any relationship to the outcomes of interest when controlling for interpersonal social networks (Research Question 1 [RQ1])? Finally, in light of the buffering hypothesis, we also examine whether the relationships we uncover differ for those who have experienced many life stressors compared to those with less objective stress (Research Question 2 [RQ2]).

Methods

Participants and procedure

Undergraduate students participated in an online survey in exchange for course extra credit. Of the 444 students who began the survey, 423 completed it. Two participants were significant outliers across multiple variables and thus were dropped from analyses. Of the remaining participants, the vast majority (95%, $n=401$) reported having a Facebook account and are the sample for these analyses. The majority of participants were female (78%). Their average age was 19.90 years ($SD=1.51$), and 57% were white.

Measures

Physical illness. Physical illness was measured with the Pennebaker Inventory of Limbic Languidness (PILL),³⁶ which assesses the frequency with which participants experience a broad array of physical symptoms and sensations. Forty-eight items from the PILL relevant to college students were included and averaged to create a composite measure of physical illness ($\alpha=0.92$).

Perceived stress. Perceived stress was assessed with the 14-item global measure of perceived stress.³⁷ These items (e.g., “how often in the past month have you felt nervous or stressed”) were measured with five-point scales, ranging from 1 (never) to 5 (very often) ($M=2.78$, $SD=0.53$, $\alpha=0.86$).

Stressful life events. At the end of the survey, participants completed the Social Readjustment Rating Scale for minors,³⁸ which includes a checklist of 48 stressful life events, including “change to a new school,” “pregnancy,” and “broken engagement.” This scale taps into cumulative life stressors, which is the standard approach for testing the buffering hypothesis.³³ Participants indicated having experienced on average 21.22 ($SD=7.10$) of the 48 stressors.

Facebook use. Participants were asked to open their Facebook accounts and indicate how long (years and months) they had been a member of Facebook, their total number of Facebook friends ($M=375$, $SD=242$), and the number of Facebook friends they considered to be close friends ($M=56$, $SD=80$). Given the positive skew of number of Facebook friends, this variable was transformed by taking its square root for analysis purposes. Participants were also asked to estimate how many times they login to Facebook per day and per week. These items were combined to obtain an estimate of daily frequency of Facebook use ($M=6.41$, $SD=4.86$).

Social network size. Social network size was assessed for both interpersonal and Facebook contexts with the social network index (SNI).^{29,39} Interpersonal network size was computed by adding the number of relatives, close friends, acquaintances, fellow students, neighbors, teachers, co-workers, and religious groups with whom participants communicate at least once every 2 weeks ($M=29.56$, $SD=8.02$). Similarly, Facebook network size was computed by adding the number of people in the relevant social groups indicated in the

SNI that they communicate with on Facebook every 2 weeks ($M=27.87$, $SD=9.72$).

Perceived social support. Perceived social support was assessed with the 12-item Multidimensional Scale of Perceived Social Support.⁴⁰ Items (e.g., “My family really tries to help me”) were rated on seven-point Likert scales ($M=6.12$, $SD=1.00$, $\alpha=0.93$).

Life satisfaction. To explore the relationship between Facebook use and psychological well-being, we included the five-item Satisfaction with Life Scale,⁴¹ which taps into the global life satisfaction component of subjective well-being. Items (e.g., “I am satisfied with my life”) were rated on seven-point Likert scales ($M=5.10$, $SD=1.31$, $\alpha=0.90$). We also assessed the traits of optimism (with the Life Orientation Test-Revised, $\alpha=0.87$)⁴² and self-esteem (with the Rosenberg Self-Esteem Scale, $\alpha=0.89$)⁴³ given their possible associations with the primary variables of interest.

Results

Path modeling was undertaken to examine the process through which Facebook friendships might link to physical and psychological health. Using AMOS 16.0, the hypothesized relationships among the key variables for H1 and H2 were modeled. In addition, paths between variables that significantly correlated were included (Table 1), and nonsignificant paths were removed to produce a final model. This process was repeated to answer RQ1 by adding interpersonal network size to the model. Finally, a moderated mediation model was run to test RQ2, comparing models for high- and low-stressed groups. As it is recommended practice to use multiple fit indices,⁴⁴ the path models' goodness of fit were judged using the following criteria: (a) a χ^2/df ratio of 5 or less, (b) a comparative fit index (CFI) of 0.90 or greater, (c) an relative fit index (RFI) close to 1, and (d) a root-mean-squared error of approximation (RMSEA) less than or equal to 0.08.

Facebook friends, perceived social support, perceived stress, and well-being

H1 and H2 predicted that number of Facebook friends would increase perceptions of social support, which would then reduce perceived stress, and in turn minimize physical illness and enhance psychological well-being. The resulting

TABLE 1. CORRELATIONS, MEANS, AND STANDARD DEVIATIONS OF VARIABLES IN THE PATH ANALYSIS

	1	2	3	4	5	6	7
1. Sex	1.00						
2. Number of Facebook friends	0.08	1.00					
3. Interpersonal network size	0.00	0.22**	1.00				
4. Perceived social support	0.26***	0.14**	0.21***	1.00			
5. Perceived stress	0.12*	-0.10*	-0.10**	-0.25***	1.00		
6. PILL	0.14**	-0.02	-0.01	-0.10*	0.38***	1.00	
7. Life satisfaction	0.09	0.20***	0.09	0.39***	-0.52***	-0.21***	1.00
M	1.78	375	29.56	6.12	2.78	0.81	5.10
SD	0.42	242	8.02	1.00	0.53	0.39	1.31

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

PILL, Pennebaker Inventory of Limbic Languidness.

model (Fig. 1) achieved an acceptable fit to the data, χ^2/df ratio = 1.42, $p = 0.20$, CFI = 0.992, RFI = 0.91, RMSEA = 0.03. As predicted, the total number of Facebook friends increased perceptions of social support ($\beta = 0.12$, $p = 0.013$), which in turn associated with reduced stress ($\beta = -0.30$, $p < 0.001$), which in turn minimized physical illness ($\beta = 0.37$, $p < 0.001$) and boosted life satisfaction ($\beta = -0.45$, $p < 0.001$). Also, the number of Facebook friends evidenced a direct relationship with life satisfaction ($\beta = 0.12$, $p = 0.003$), as did perceived social support ($\beta = 0.26$, $p < 0.001$). Given the indirect relationship between number of Facebook friends and physical illness, H1 is supported. The indirect and direct relationships of Facebook friends with life satisfaction support H2.

In further support of the hypotheses, self-reported Facebook network size also associated with perceived social support at a level comparable, though slightly smaller, to that of the actual number of friends ($\beta = 0.09$, $p = 0.08$). However, the estimated number of close friends on Facebook did not associate with perceived social support ($\beta = 0.04$, $p = 0.41$). Thus, it seems that the objective number of friends, rather than the quality of those relationships, drove the predicted associations.

Comparing the palliative influence of Facebook versus interpersonal network size

To explore RQ1, we ran another model that included interpersonal network size. The model yielded an acceptable fit to the data, χ^2/df ratio = 0.995, $p = 0.45$, CFI = 1.00, RFI = 0.923, RMSEA = 0.000. As shown in Figure 2, interpersonal network size associated with perceived social support as well as number of Facebook friends, and consequently reduced the relationship between the latter variables to below the threshold of statistical significance ($\beta = 0.08$, $p = 0.11$). Thus, number of Facebook friends did not offer unique benefits to perceived social support beyond that of one's interpersonal network. However, the relationship to life satisfaction persisted ($\beta = 0.12$, $p = 0.003$), suggesting that there are unique psychological benefits to having many friends on Facebook beyond the role of interpersonal networks.

The role of Facebook friends for high-versus low-stressed individuals

To test the buffering hypothesis (RQ2), we divided the sample into higher- versus lower-stress groups, based on a

median split on the number of experienced life stressors. Results of a moderated mediation model (Fig. 3A, B) suggested that for those who had experienced fewer life stressors, interpersonal network size significantly associated with perceived social support ($\beta = 0.27$, $p < 0.001$), whereas number of Facebook friends did not ($\beta = 0.04$, $p = 0.52$). However, for those who had experienced more life stressors, the number of Facebook friends maintained a significant path to perceived social support ($\beta = 0.14$, $p = 0.04$), whereas the path from the interpersonal network size was reduced to nonsignificance ($\beta = 0.08$, $p = 0.24$). The model had an acceptable fit to the data, χ^2/df ratio = 0.78, $p = 0.72$, CFI = 1.00, RFI = 0.887, RMSEA = 0.000. Thus, these data support the buffering hypothesis for the total number of Facebook friends, above and beyond the effect of interpersonal networks.

Discussion

This research was designed to explore whether the social affiliation opportunities made available through SNSs, like Facebook, offer the same psychological and physical health benefits that interpersonal social networks have been shown to confer. As predicted, number of Facebook friends (though no other measure of Facebook use) associated with greater perceived social support, which in turn associated with reduced stress, and in turn less physical illness and greater psychological well-being. This effect was minimized when interpersonal network size was taken into consideration. However, for those who had experienced more objective life stressors, number of Facebook friends continued to be the stronger predictor of perceived social support. These results, then, provide support for the buffering effect of Facebook friends, offering unique evidence that even in light of interpersonal social networks, highly stressed individuals receive health benefits from their Facebook friends.

These results are not entirely consistent with past findings, as Kim and Lee¹¹ did not find perceived social support to mediate the relationship between number of Facebook friends and psychological well-being. This discrepancy is likely readily explained, however, by the differences in measures used. Kim and Lee¹¹ used the Interpersonal Support Evaluation List, which measures perceived availability of four social support resources all modified for the Facebook context, whereas we used a more general perceived social support scale that was not linked to Facebook. Thus, number

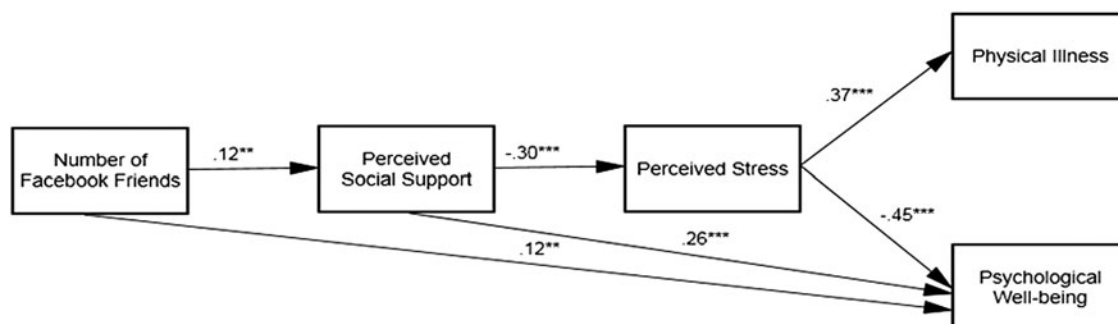


FIG. 1. The influence of number of Facebook friends on physical and psychological well-being. Each coefficient is significant at $p < 0.05$. χ^2/df ratio = 1.42, $p = 0.20$, CFI = 0.99, RFI = 0.91, RMSEA = 0.03. Sex was included in the model but not depicted in the figure in the interest of parsimony in presentation. CFI, comparative fit index; RFI, relative fit index; RMSEA, root-mean-squared error of approximation.

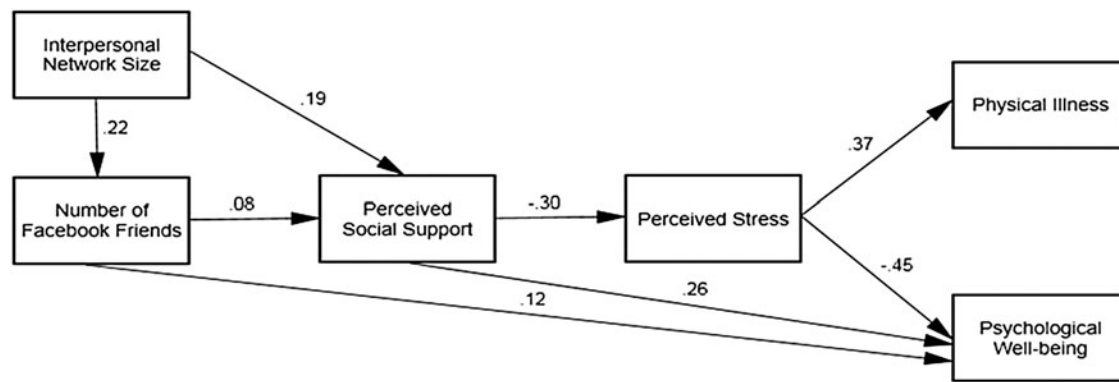


FIG. 2. The influence of number of Facebook friends and interpersonal network size on physical and psychological well-being. Each coefficient is significant at $p < 0.05$ with the exception of the number of Facebook friends-perceived social support relationship. Sex was included in these analyses though omitted from the figure for the sake of parsimony in presentation. χ^2/df ratio = 0.995, CFI = 1.00, RFI = 0.923, RMSEA = 0.000. CFI, comparative fit index; RFI, relative fit index; RMSEA, root-mean-squared error of approximation.

of Facebook friends may not relate to perceived social support from Facebook, though it may relate to perceived social support in general. Worth noting, our data were consistent with past studies^{8,9} suggesting that Facebook use frequency does not benefit life satisfaction. In light of the collection of research to this point, it seems that the number of Facebook friends, but not Facebook usage *per se*, benefits psychological

well-being, though it is still too early to make definitive claims.

Why would only the absolute number of Facebook friends predict perceived social support and subsequent health benefits and not other measures of Facebook use? We reason that Facebook users apply a heuristic based on their number of friends to gauge social support availability. The greater the

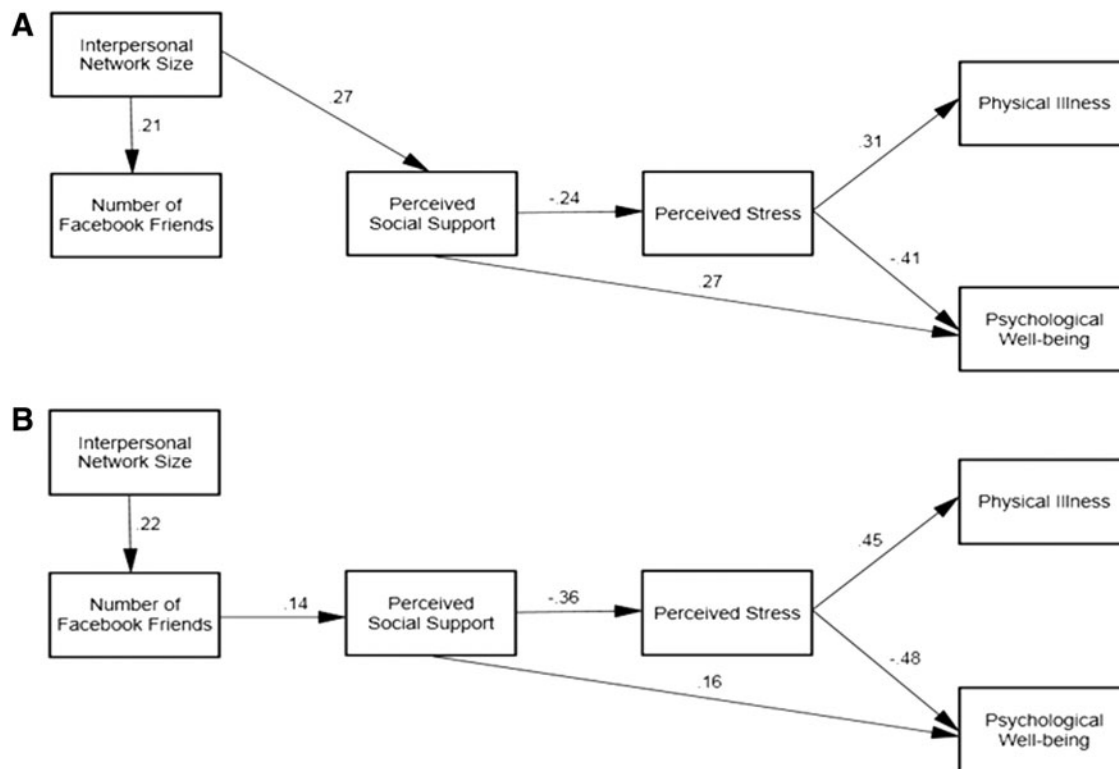


FIG. 3. (A) The influence of number of Facebook friends and interpersonal network size on physical and psychological well-being for low-stressed groups. Each coefficient is significant at $p < 0.05$. χ^2/df ratio = 0.96, $p = 0.49$, CFI = 1.00, RFI = 0.824, RMSEA = 0.000. (B) The influence of number of Facebook friends and interpersonal network size on physical and psychological well-being for high-stressed groups. Each coefficient is significant at $p < 0.05$. χ^2/df ratio = 0.82, $p = 0.62$, CFI = 1.00, RFI = 0.929, RMSEA = 0.000. CFI, comparative fit index; RFI, relative fit index; RMSEA, root-mean-squared error of approximation.

number of friends, the more connected people perceive themselves to be, regardless of the exact nature of that connection, the messages received, and so on, which in turn opens people up to the benefits of perceiving greater support (i.e., reduced stress and enhanced well-being). Indeed, this notion of a “friends” heuristic can help explain why the total number of Facebook friends offered palliative benefits beyond that of interpersonal networks for those under high stress. Specifically, those under high stress may feel less connected and thus be more sensitive to cues of social connectedness. One’s number of Facebook friends is a readily available cue that is not available in the interpersonal realm.

There are, of course, other possible explanations for our findings. Most notably, perhaps Facebook and interpersonal network sizes associate with personality traits, like extraversion⁴⁵ and shyness,⁴⁶ which also relate to well-being.^{47,48} To address this alternative hypothesis, we reran our analyses including measures of optimism and self-esteem, both of which related significantly to Facebook network size, perceived stress, perceived social support, and psychological well-being. The majority of the relationships reported were not meaningfully altered, though including self-esteem did affect some relationships with perceived social support. Given that one’s social network size likely influences self-esteem, we believe that it is more likely an additional mediator rather than an alternative explanation. Further, in each case the Facebook friends–psychological well-being relationship endured. Thus, we believe that it is unlikely that personality traits fully explain our findings. Still, exploring key motivations for Facebook use as they relate to social interaction (e.g., the need to belong and need for self-presentation)^{49,50} may help shed greater light on this dynamic.

There are certainly limitations to this research. First, the cross-sectional nature of the data precludes claims of causality, though the models presented are consistent with processes laid out in the coping literature. Second, though the sample was adequately powered to detect small associations, it was not adequately powered to detect differences in small associations, which would have required much larger sample sizes. Finally, though we employed previously used and validated measures of physical illness, our primary dependent measure was still based on self-report, which is susceptible to reporting error. Clearly, additional research is needed to validate and elaborate on the findings reported herein.

Despite these possible concerns, this research presents unique evidence that number of Facebook friends can indirectly benefit both physical health and psychological well-being through processes involving perceived social support. We argue that these findings are explained by the application of a “more-friends-the-better” heuristic, which suggests that the more friends one has, the more connected one feels, regardless of actual feedback provided. We wish to be clear that we do not believe that this heuristic, assuming it exists, is susceptible to manipulation by simply collecting Facebook friends indiscriminately. The heuristic would work only to the extent one believes in the integrity of one’s Facebook network—that it was developed organically and thus is a meaningful indicator of one’s social connections. As we await more nuanced understanding of the conditions under which this heuristic is applied and to what effect, we can conclude

that apart from what our friends may say, when it comes to Facebook, the more friends the merrier.

Author Disclosure Statement

No competing financial interests exist.

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