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FlashReport

How many *likes* did I get?: Purpose moderates links between positive social media feedback and self-esteem.Anthony L. Burrow^{*}, Nicolette Rainone

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ABSTRACT

Sociometer theory asserts that self-esteem is calibrated to one's perceived relational value. Accordingly, positive feedback should boost self-esteem because it signals acceptance by others. Yet, the extent to which self-esteem is sensitive to positive feedback may depend on individuals' sense of purpose. In two studies ($N = 342$), we tested purpose in life as a source of self-directed and prosocial motivation and predicted that having greater purpose would lessen sensitivity to social media feedback. Study 1 revealed that the number of likes individuals received on their Facebook profile pictures was positively associated with self-esteem. Study 2 replicated these findings experimentally by manipulating the number of likes individuals received on self-photographs posted to a mock Facebook site. In both studies, links between likes and self-esteem were diminished for those with greater purpose. Implications for purpose as a moderator of the self-esteem contingencies of positive social feedback are discussed.

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Facebook, the world's largest online social network, allows users to "like" the content they view with the click of a button. The simplicity of liking posted material has made doing so extraordinarily popular, with nearly 4.5 billion likes generated daily and half of all users liking at least one post they view every day (Pew Research Center, 2014). But what impact does this proliferation of likes have on those receiving them? On one hand, accumulating evidence suggests a positive influence: receiving affirmation on content posted virtually corresponds positively with self-esteem and subjective well-being and negatively with loneliness (Bazarova, Choi, Schwanda Sosik, Cosley, & Whitlock, 2015; Burke, Marlow, & Lento, 2010; Oh, Ozkaya, & LaRose, 2014; Valkenburg, Peter, & Schouten, 2006). On the other hand, relying on affirmation from others in order to feel good about oneself may signal contingent self-worth, which can undermine well-being over time (Kernis, Paradise, Whitaker, Wheatman, & Goldman, 2000). Adjudicating between these possibilities is important as seeking attention and acknowledgement from others are reported as primary drivers of Facebook use (Sung, Lee, Kim, & Choi, 2016; Stefanone, Lackaff, & Rosen, 2011).

A central aim of the current research was to examine the extent to which virtual likes influence how individuals feel about themselves. We based our examination on sociometer theory (Leary & Baumeister, 2000; Leary & Downs, 1995), which holds that self-esteem is calibrated to cues of inclusion or rejection within the social environment. From this perspective, how individuals feel about themselves is a dynamic

and self-regulatory gauge of one's relational value. Several experiments and field studies confirm that self-esteem is elevated when individuals are (or imagine being) included, accepted, or deemed popular by others (Denissen, Penke, Schmitt, & van Aken, 2008; Leary, Tambor, Terdal, & Downs, 1995; Reitz, Motti-Stefanidi, & Asendorpf, 2015). Notably, having Facebook friends who are more responsive can satisfy psychological needs above and beyond the number of Facebook friends one has (Greitemeyer, Mügge, & Bollermann, 2014). Because receiving positive feedback can signal acceptance within one's social environment, we predicted that self-esteem would increase as a function of the number of likes one received on their personal photographs.

It should be noted, however, the extent to which self-esteem relies on perceptions of one's relational value can be limited by other factors. For example, among individuals driven by strong personal goals and motivations, social inclusion is a much weaker predictor of self-esteem (Guay, Delisle, & Fernet, 2008). Thus, we also predicted that having a sense of purpose in life – or a "self-organizing life aim that organizes and stimulates goals, manages behaviors, and provides a sense of meaning" (McKnight & Kashdan, 2009, p. 242) would moderate the effect of likes on self-esteem. Specifically, this effect should manifest primarily for those lacking purpose, but should have little to no influence for those with a greater sense of it because the self-esteem of purposeful individuals should be less contingent on social approval. In addition, because purpose is conceptualized as a prosocial motivation, whereby purposeful individuals strive to accomplish goals that are both personally meaningful and relevant to the world beyond the self (Damou, Menon, & Cotton Bronk, 2003), those scoring higher in purpose should be expected to show less sensitivity to positive social media feedback

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because they are already guided by a sense of connection with and service to others. This hypothesis is further supported by previous studies that have found that individuals with strong civic and prosocial orientations tend to use Facebook for informational reasons rather than status enhancement or socialization (Park, Kee, & Valenzuela, 2009), and emotional consequences of Facebook use are most pronounced when people lack a sense of meaning (Sagioglou & Greitemeyer, 2014). Thus, evoking one's sense of personal motivation and prosocial goals (i.e., purpose; Damon et al., 2003) may more reliably decouple self-esteem from social feedback.

While prior research has consistently found that purposeful individuals have higher self-esteem (Scheier et al., 2006), a conceptual distinction can be drawn between the two constructs. Whereas self-esteem refers to one's appraisals of her or his value (Leary & Baumeister, 2000), purpose represents a prospective life aim that is already valued. Thus, the current study provides an initial test of purpose as a resource for disrupting the positive feedback contingencies of self-esteem. Evidence in favor of this capacity would be significant for two main reasons. First, the buffering effects of purpose, to date, have only been demonstrated in contexts of stress reactivity. Confirmation that purpose also attenuates reactivity to *positive* stimuli (receiving likes) would broaden understanding of purpose as a source of psychological self-regulation and homeostasis. Second, it would situate purpose as an arbiter of when self-esteem operates as a sociometer; thus supporting purpose theories that claim that purpose involves pursuing aims that one believes are of value to others. Finally, provided the widespread exposure to likes and other virtual expressions of affirmation common on social media sites, purpose enhancement might offer an accessible point of intervention for promoting more adaptive outcomes among users.

1. Study 1

1.1. Methods

1.1.1. Participants and procedure

Participants were 300 adults (49% women) between the ages of 18 and 69 ($M_{age} = 32.63$, $SD = 10.20$) recruited through Amazon Mechanical Turk. Because past studies have relied on much smaller sample sizes to detect moderating effects of purpose in life on ratings of self-relevant attitudes and satisfaction (sample sizes ranging from 49 to 151; Heisel & Flett, 2004; Steger, Oishi, & Kesebir, 2011), we sought to utilize a much larger sample to test our predictions. Data collection did not depend on any analysis of results. Respondents were only included in analyses if they reported having (a) an active Facebook account, (b) at least 20 friends in their virtual network, and (c) received fewer than 200 likes on their average profile picture in order to ensure that the sample reflected the average Facebook user. Based on these criteria, 246 respondents were retained. All measures used in this study are reported below.

1.1.2. Measures

1.1.2.1. Purpose in life. Purpose in life was assessed using the six-item Life Engagement Test (Scheier et al., 2006). Participants indicated the extent to which they agreed with statements such as, "There is not enough purpose in my life" (reverse scored), "To me, the things I do are all worthwhile" and "I have lots of reasons for living". Responses ranged from 1 (*strongly disagree*) to 5 (*strongly agree*).

1.1.2.2. Self-esteem. Self-esteem was assessed using the 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965; $\alpha = 0.92$). Participants reported the extent to which they agreed with each item (i.e. "On the whole, I am satisfied with myself") using a scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

1.1.2.3. Facebook information. Participants with active Facebook accounts reported the total number friends in their network, how many likes their current profile picture has received, and how many likes their profile pictures tend to receive on average.

1.1.2.4. Covariates. Because individual differences in Big Five personality traits, narcissism, and positive mood may contribute to variance in self-esteem (Erdle & Rushton, 2011; Robins, Hendin, & Trzesniewski, 2001), and are known correlates of purpose (e.g. Scheier et al., 2006), we included these factors as covariates in our analyses. Big Five personality traits were assessed using the 20-item Mini-IPIP (Donnellan, Oswald, Baird, & Lucas, 2006). Sample items and scale reliabilities were: "I am the life of the party" (extraversion; $\alpha = 0.80$), "I sympathize with others' feelings" (agreeableness; $\alpha = 0.81$), "I get chores done right away" (conscientiousness; $\alpha = 0.73$), "I have a vivid imagination" (openness; $\alpha = 0.67$), and "I have frequent mood swings" (neuroticism; $\alpha = 0.71$). Four additional items assessed narcissism (i.e. "I like to look at myself in the mirror"; $\alpha = 0.90$). Responses ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). General mood was assessed using 10-discrete ($\alpha = 0.90$) items from the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988). Participants were asked to indicate the extent to which they generally felt each emotion ranging from 1 (*not at all*) to 5 (*extremely*).

1.2. Results and discussion

Descriptive statistics for study variables are provided in Table 1. To test our hypothesis, a multivariate regression examined whether the average likes participants received on their profile photos, sense of purpose, and their interaction predicted self-esteem (see top of Table 2). These predictors explained 65% of the variance in self-esteem, $F(3, 244) = 158.92$, $p < 0.001$. A significant main effect detected for purpose ($\beta = 0.80$, $p < 0.001$) was qualified, however, by its interaction with average number of photo likes received, $\beta = -0.13$, $p = 0.001$.

To further test whether this effect persisted after adjusting for our covariates, we conducted a separate regression including demographic variables, personality traits, narcissism, positive mood, total number of Facebook friends, average likes received on their profile photos, and sense of purpose in life as predictors of self-esteem (see bottom of Table 2). Together, these predictors explained 73% of the variance in self-esteem, $F(13, 245) = 57.67$, $p < 0.001$. A main effect detected for purpose ($\beta = 0.49$, $p < 0.001$) was qualified by its interaction with average number of photo likes received, $\beta = -0.09$, $p = 0.002$. As illustrated in Fig. 1, simple-slopes tests indicated that receiving a greater number of likes was positively associated with self-esteem for those scoring low (-1 SD) in purpose ($\beta = 0.14$, $p = 0.002$), but was unrelated to self-esteem for those scoring high ($+1$ SD) in purpose ($\beta = -0.04$, $p = 0.337$). Overall, results supported the prediction that at lower levels of purpose, the number of likes individuals received were more strongly associated with levels of self-esteem.

2. Study 2

In Study 1, individuals self-reported the number of likes they typically receive on their Facebook profile pictures. However, such reporting is susceptible to bias due to social desirability and recall limitations, potentially leading to faulty estimates. In addition, the correlational nature of the data obscured evidence of the directionality of the demonstrated effects. To address these limitations in Study 2, we used an experimental manipulation to inform participants that they received either a low, average, or high number of likes on self-photographs ("selfies") prior to completing measures of self-esteem. All measures, manipulations, and excluded participants are reported below.

Table 1
Bivariate, means, and standard deviations for Study 1 variables.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Gender	–												
2. Age	–0.20*	–											
3. Openness	–0.05	0.12	–										
4. Conscientiousness	0.02	0.25**	0.26**	–									
5. Extraversion	–0.08	0.06	0.22**	0.05	–								
6. Agreeableness	–0.20*	0.12	0.34**	–0.17**	0.26**	–							
7. Neuroticism	–0.14*	–0.12	–0.29**	–0.39**	0.24**	–0.10	–						
8. Narcissism	0.06	–0.27**	–0.04	0.00	–0.26**	–0.25**	–0.15*	–					
9. Positive affect	0.04	0.14	0.06	0.16*	0.31**	0.07	–0.20**	0.37**	–				
10. Total friends	–0.01	–0.13*	0.10	–0.06	0.19**	0.08	–0.09	0.03	–0.02	–			
11. Avg. likes	–0.23**	0.10	0.05	–0.08	0.26**	–0.00	–0.11	0.18**	0.22**	0.29**	–		
12. Purpose in life	–0.03	0.13*	0.31**	0.41**	0.32**	0.25**	–0.46**	0.17**	0.33**	0.13**	0.13*	–	
13. Self esteem	0.03	0.21**	0.37**	0.46**	0.32**	0.21**	–0.58**	0.18**	0.31**	0.13*	0.11	0.70**	–
Mean	–	32.57	3.66	3.55	2.74	3.61	2.64	2.57	2.80	371	18.48	3.66	3.65
SD	–	10.19	0.77	0.85	0.95	0.87	0.89	1.09	0.81	446	18.07	0.85	0.84

Note. Gender (0 = Male, 1 Female). All *p*-values are 2-tailed.

* = *p* < 0.05.

** = *p* < 0.01

2.1. Methods

2.1.1. Participants and procedure

Participants were 102 undergraduate students (74% female) aged 18 to 31 (*M*_{age} = 20.14, *SD* = 1.84) at a large northeastern university. Six respondents were omitted because they failed an attention check. Based on an anticipated small effect size (Cohen's *f*² = 0.1), a power analysis determined a sample size of 114 would be required to reach adequate power of 0.80. Data collection did not depend on any analysis of results.

Participants began the study by completing a demographics form, a measure of purpose in life (*α* = 0.84; same as described in Study 1), and a personality inventory that was not included in present analysis because it was administered pre-manipulation and, as a covariate, was found not to account for the hypothesized effects in Study 1. After completing the survey, an experimenter explained to participants that the aim of the study was to pilot test a new social media site that resembled Facebook (in actuality no new site had been created). Participants were told that in order to test some of the features of the interactive features of site, they would need to create a new personal profile by taking a photograph of themselves to be uploaded by the experimenter. The

experimenter then provided participants with a digital camera and asked them to take a selfie. After taking the selfie, the experimenter ostensibly uploaded the photograph to the site by connecting the camera to a computer with a monitor that was not visible to participants. Participants were told their photograph was being displayed for 5 min and that other users would have the chance to view and like their picture. While they waited for their results, participants completed a word-find task designed as a distraction. After 5 min had passed, participants were given randomized feedback about their selfie. Specifically, they were told that compared to pilot testing, their selfie had received the average number of likes (27 likes; *n* = 32), above the average number of likes (48 likes; *n* = 30), or below the average number of likes (6 likes; *n* = 34). Finally, participants completed a post-manipulation measure of self-esteem (*α* = 0.91; same as Study 1).

2.2. Results and discussion

Across participants, both purpose (*M* = 4.11, *SD* = 0.63) and self-esteem (*M* = 3.84, *SD* = 0.72) were above the midpoint on both scales, and were positively correlated, *r* = 0.58, *p* < 0.001.

To establish that our manipulation operated in a manner consistent with sociometer theory, we first examined whether self-esteem was influenced by condition. An omnibus ANOVA revealed that participants in the high likes condition (*M* = 4.12, *SD* = 0.55) reported significantly higher self-esteem than those who received a low (*M* = 3.74, *SD* = 0.79) or average (*M* = 3.70, *SD* = 0.74) number of likes, *F*(2, 95) = 3.33, *p* < 0.040, *d* = 0.56. A planned contrast confirmed the high likes condition reported higher self-esteem than the combined average and low likes conditions, *t*(93) = –15.36, *p* < 0.001. Therefore, to test our main hypothesis that boosts in self-esteem caused by receiving a high number of likes would be attenuated among participants who had a

Table 2
Hierarchical regression estimates predicting self-esteem in Study 1.

Predictors	<i>B</i>	<i>SE B</i>	<i>β</i>	95% <i>CI Lower</i>	95% <i>CI Upper</i>
<i>Unadjusted model</i>					
Average likes received	0.04	0.03	0.04	–0.03	0.10
Purpose in life	0.67***	0.03	0.79	0.61	0.73
Purpose × likes received	–0.09**	0.03	–0.11	–1.56	–0.03
<i>Adjusted model</i>					
Gender	0.06	0.06	0.03	–0.07	0.17
Age	0.08*	0.03	0.10	0.00	0.01
Openness	0.12**	0.04	0.11	0.04	0.20
Conscientiousness	0.14**	0.04	0.14	0.06	0.22
Extraversion	0.05	0.03	0.05	–0.02	0.11
Agreeableness	–0.04	0.07	–0.04	–0.11	0.04
Neuroticism	–0.18***	0.04	–0.19	–0.25	–0.10
Narcissism	0.08*	0.03	0.10	0.02	0.15
Positive affect	–0.03	0.04	–0.03	–0.11	0.05
Total FB friends	0.00	0.00	0.04	0.00	0.00
Average likes received	0.04	0.03	0.04	–0.03	0.10
Purpose in life	0.49***	0.04	0.58	0.42	0.56
Purpose × likes received	–0.09**	0.03	–0.10	–1.46	–0.03

Notes. *F*(13, 245) = 57.67, *p* < 0.001. *R*² = 0.73. Gender: female = 1, male = 0.

* *p* < 0.05.

** *p* < 0.01.

*** *p* < 0.001.

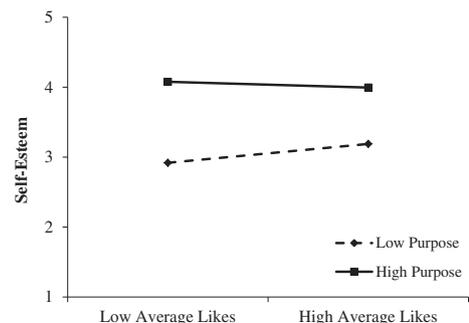


Fig. 1. Interaction between likes received and purpose predicting self-esteem in Study 1.

greater sense of purpose in life we ran two separate regression analyses to test our hypothesis: (1) a model including all three experimental conditions, and (2) a follow-up model in which the low and average likes conditions were combined.

In the regression model with all three conditions considered, two dummy-codes were created to uniquely identify members of the low likes and high likes conditions; (participants were assigned a 0 = if they were not members and a 1 = if they were members of these conditions, respectively). Thus, by entering both of these dummy-codes into the model simultaneously, the average likes condition served as the reference group. The dummy-scored feedback conditions, purpose, and their interactions were entered as predictors of self-esteem (see top of Table 3). Together, these predictors explained 41% of the variance in self-esteem, $F(5, 95) = 14.20, p < 0.001$. The only significant interaction emerged between the purpose and the high likes dummy condition, ($\beta = -0.28, p = 0.04$). Simple-slopes tests indicated that compared to the average likes condition, receiving a high number of likes was positively associated with self-esteem for those low (-1 SD) in purpose ($\beta = 0.77, p = 0.003$), but was unrelated to self-esteem for those high ($+1$ SD) in purpose ($\beta = 0.09, p = 0.579$).

In the follow-up model, demographic variables, modified feedback condition, purpose, and feedback condition X purpose were entered as predictors of self-esteem (see bottom of Table 3). Together, these predictors explained 41% of the variance in self-esteem, $F(5, 94) = 14.77, p < 0.001$. Significant main effects for both purpose and feedback conditions were qualified by an interaction between the two, ($\beta = -0.31, p = 0.014$). As illustrated in Fig. 2, simple-slopes tests indicated that receiving a greater number of likes was positively associated with self-esteem for those low (-1 SD) in purpose ($\beta = 0.70, p < 0.001$), but was unrelated to self-esteem for those high ($+1$ SD) in purpose ($\beta = 0.07, p = 0.683$).

3. General discussion

While the like button did not appear on Facebook for the site's first five years of operation, its emergence has not gone unnoticed. With billions of likes conferred daily, the common Facebook user may be justified in worrying less about whether anyone will like what they post and instead wonder just how many likes they will receive. When the aim is to boost self-esteem, the current research suggests: the more the better. Whether self-reported (Study 1) or manipulated (Study 2),

Table 3 Hierarchical regression estimates predicting self-esteem in Study 2.

Predictors	B	SE B	β	95% CI Lower	95% CI Upper
<i>Unadjusted model</i>					
Below average likes	0.01	0.14	0.00	-0.27	0.28
Above average likes	0.39**	0.14	0.25	0.11	0.67
Purpose in life	0.57***	0.13	0.76	0.31	0.82
Purpose \times above average likes	-0.01	0.16	-0.01	-0.33	0.31
Purpose \times above average likes	-0.32*	0.16	-0.28	-0.64	-0.01
<i>Adjusted/modified model</i>					
Gender	0.14	0.12	0.08	-0.11	0.38
Age	0.01	0.03	0.01	-0.05	0.06
Likes received: low-0 vs. high-1	0.37**	0.12	0.25	0.14	0.63
Purpose in life	0.56***	0.08	0.74	0.40	0.72
Purpose \times likes received	-0.31*	0.13	-0.27	-0.56	-0.07

Notes. Unadjusted model Adjusted model $F(5, 95) = 14.20, p < 0.001. R^2 = 0.41$. Average likes is reference group for above and below average likes. Adjusted model $F(5, 94) = 14.77, p < 0.001. R^2 = 0.41$.

Gender: female = 1, male = 0.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.01$.

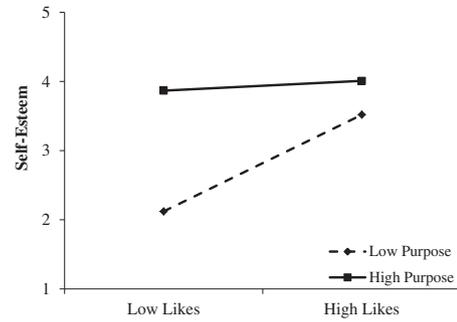


Fig. 2. Interaction between likes condition and purpose predicting self-esteem in Study 2.

receiving a greater number of likes reliably predicted greater self-esteem. This pattern of results corroborates and extends precepts of sociometer theory insofar that individuals' self-esteem was responsive to evidence of one's value to others, even in virtual environments. Notably, however, purpose in life attenuated this association; having a stronger sense of purpose disrupted the extent to which self-esteem was contingent on evidence of one's social value.

Why might purpose act as a moderator in the relationship between social media feedback and self-esteem? Recent research has found that adolescents who viewed photographs posted to social media that had received more likes demonstrated greater activation of neural regions involved in reward processing (Sherman, Payton, Hernandez, Greenfield, & Dapretto, 2016). If receiving or observing likes activates these neural regions, then lessening responsiveness to them likely requires inhibiting reactions to them as social endorsements. Interestingly, Burrow and Spreng (2016) found that purpose in life inhibits impulsivity to reward seeking. Thus, greater inhibition may be a mechanism by which purpose contours the impact of social appraisals on self-esteem. Future studies should examine this possibility by incorporating measures of purpose into studies of reward processing of social media feedback. This may be of greatest benefit to youth populations given their known susceptibility to peer endorsement and increased frequency of social media use.

A potential concern in interpreting our findings is the strong correlation detected between purpose and self-esteem in both studies. Perhaps at high levels of purpose, greater likes showed no association with self-esteem due to ceiling effects, thus limiting the potential for increased self-esteem. To clarify this possibility empirically, a median-split on the purpose variable in Study 1 showed that those highest in purpose had a mean of 4.20 and a standard deviation of 0.55 on the 5-point self-esteem scale (compared to 3.20 and 0.66 among those lowest in purpose). Thus, substantial variability in reported self-esteem existed even among those indicating higher levels of purpose.

Having supported our hypotheses, we can now revisit the implications of purpose as an arbiter of the self-esteem – positive feedback link outlined above. As noted, past work has primarily showcased purpose as a buffer to stressful experience. For example, it is known that purposeful individuals recover faster after viewing threatening stimuli (Schaefer et al., 2013), and show less distress when navigating settings characterized by higher proportion of social outgroups (Burrow & Hill, 2013). The current findings extend this attenuating role to shaping reactions to positive experiences. While limiting the magnitude of self-esteem derived from receiving likes may run counter to notions of a psychological resource, it is consistent with studies showing the damaging effects of contingent and unstable self-esteem (Kernis et al., 2000).

In addition, while some theories of purpose describe it as a self-focused pursuit (e.g., McKnight & Kashdan, 2009), others mandate that it must involve an intention to contribute to the world beyond the self (e.g., Damon et al., 2003). Consistent with the sociometer perspective, purpose may reduce the import of fleeting affirmations such as likes, by reminding individuals they are already inherently striving to

accomplish aims they believe are of significant social value. However, it is important to note that while purposeful individuals may be less reactive to the number of likes they receive on a selfie, such feedback on content intended to be more representative of their life pursuits (e.g., status updates about one's future goals, or shared video clips detailing one's desired profession) may elicit a discernable response. In support of this possibility, McKnight and Kashdan (2009) suggest that individuals with the greatest sense of purpose may suffer the most when perceiving obstacles to pursuing it. Thus, future studies might examine the effect of both positive and negative feedback on purpose-relevant social media posts, as a means of identifying conditions under which having a strong sense of purpose could be associated with vulnerability. Additionally, our findings support purpose as a resource that could be bolstered as a means of promoting more optimal outcomes. There is emerging empirical evidence to suggest that curating one's Facebook profile can be a source of self-affirmation (Toma & Hancock, 2013), and protective against identity threats. Future work might explore opportunities for individuals to cultivate and affirm one's purpose through information shared on their profiles as a way of protecting them against the negative consequences of positive feedback, while still enjoying the benefits of Facebook use.

The present study focused exclusively on likes as a form of positive feedback. However, our central predictions should be continued to be tested using the variety of other forms of feedback that are commonplace on social media platforms. It should also be noted that the benefits associated with receiving positive feedback on social media may be uniquely contextualized, considering evidence that spending greater amounts of time on Facebook has been linked to decreased subjective wellbeing and life satisfaction (Kross et al., 2013). Thus, the fuller role of purpose needs to be examined across a more comprehensive set of virtual media users' experiences going forward. Still, the present findings lend growing credence to purpose as a psychological asset for those who cultivate it; an asset worth having both off- and on-line.

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