Social achievement goals and social media

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A B S T R A C T

Social media use is an increasingly prevalent part of modern life and allows for a wide variety of ways to engage with others. The current research examines how chronic social goal orientations relate to social media use and to individuals' sense of connection with others while using social media. Utilizing social achievement goal theory, we hypothesized that social goal orientations would predict 1) the likelihood of engaging with a larger audience on social media, 2) whether social media was used in a relatively active, deep, and interactive manner, and 3) the degree to which social media involvement leads to a feeling of social connection. Results of two studies supported our hypotheses and suggested that social development, social demonstration-approach, and social demonstration-avoid goals relate to different kinds of social media behavior and different perceptions of social connection in relation to their social media use. Findings suggest that social media provide a variety of ways for individuals to attain a sense of social competency and connection that are consistent with their underlying goal orientations.

1. Introduction

As the popularity of social media sites continues to rise, so too rises the interest in studying the psychological motivations behind its use (see Wilson, Gosling, & Graham, 2012 for a review). Researchers have recently begun to explore not only how individuals use social media, but also how their use of social media relates to individual difference variables. For example, existing research has demonstrated a link between extraversion and online posting (Lee, Ahn, & Kim, 2014; Marshall, Lefringhausen, & Ferenczi, 2015), and other work has linked conscientiousness to online interpersonal communication (Marshall et al., 2015; Seidman, 2013). Some have suggested that use of these sites is often driven by the desire for self-presentation, as well as the need to belong (Nadkarni & Hofmann, 2012), as the ability to create and share content on these sites allows for a variety of opportunities for carefully constructed self-presentation (Zhao, Grasmuck, & Martin, 2008).

Although research has investigated the link between personality variables and social media use, the field has yet to examine social media use as it may relate to differences in social achievement goal orientations (which are explained in greater detail below). In other words, people differ in their chronic motivations for social interaction, and research has yet to examine if these chronic differences are related to different ways of using social media. Furthermore, one's goals for using social media may impact not only the way one connects with others on social

media sites, but also perceptions of social bonds that come with such social media activity. Broadly, research has found seemingly conflicting results regarding the effects of social media use on social connection. Some work has found it to have detrimental effects on one's social life, leading to poorer social skills, lower well-being, and discouraging in-person interactions (e.g., Caplan, 2003; Rae & Lonborg, 2015), or leading to compulsive use and thus greater loneliness (Caplan, 2003; Kim, LaRose, & Peng, 2009; Turkle, 2011). Conversely, other work has linked social media use to satiation of social needs by providing a convenient way to connect with others (e.g., Ahn & Shin, 2013; Kim et al., 2009). For example, people may utilize social networking sites to show others attention and develop trust (Ellison, Vitak, Gary, & Lampe, 2014). It remains unanswered, then, why some individuals may find social media to have detrimental effects, whereas others find that it benefits people's lives.

We propose that differences in chronic motivations for social interaction will predict the ways in which individuals use social media, as well as the impact of such social media use on feelings of social connection. Given the diverse functions and features of a range of social media applications, people have opportunities to use social media in a variety of ways. For the purposes of the current research, we focus on three types of social media use. Specifically, we examine whether social goals are associated with 1) social media activities that allow individuals to engage with a wide audience (i.e., posting/responding to content only

if one believes a large number of people will see it and/or respond), 2) active posting on social media (e.g., posting pictures, status updates, or tweets), and 3) using social media with the purpose of progressing or maintaining social relationships. Furthermore, beyond the manner in which individuals use social media, we also examine how social goals influence the social outcomes of social media use. Specifically, we examine whether individuals will experience a greater sense of social connection and closeness with others in relation to their overall social media use. Lastly, in consideration of humans' broad social worlds (which include interactions via social media and other contexts), we also examine social goals in relation to social interactions with others that occur in person or via conversing/texting on the phone. In summary, we propose that differences in social achievement goal orientations will predict differences in both social media use and outcomes of social media activity.

1.1. Social achievement goals

1.1.1. Achievement goal theory

Achievement goal theory (AGT) provides a useful framework for examining the motives that guide social media. AGT is often used as a framework for understanding motivation, particularly in the context of academics and sports (e.g., Ames, 1992; Nicholls, 1984; Roberts, Treasure, & Kavussanu, 1995; Senko, Durik, & Harackiewicz, 2008). AGT offers insight into how people pursue and define a sense of competence in their lives. With mastery goals, individuals tend to focus on how to develop their skills/abilities. With performance goals, individuals tend to focus on validating their abilities by outperforming their peers. In many cases, mastery goals have been shown to be associated with positive outcomes, such as demonstrating greater interest in and active engagement with academic material (Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000). In contrast, performance goals often meet with more mixed results. In some cases, performance goals are related to greater surface level— rather than deep— learning (e.g., Elliot, MacGregor, & Gable, 1999; Harackiewicz et al., 2000). For example, if individuals were primarily focused on outcomes, then achieving a high score on an exam would be prioritized over thoroughly understanding a topic. Other research shows that performance goals may relate to positive outcomes, such as greater effort and achievement (e.g., Bouffard, Vezeau, & Bordeleau, 1998; Harackiewicz et al., 2000). That is, performance goals may drive individuals to be more successful, as a high level of achievement may be necessary to outperform others.

1.1.2. Social achievement goals

Although much of the early work on achievement goals focused on educational or athletic domains, Ryan and Shim (2006) extended previous work on AGT to the domain of social motivations by dividing social goals into social development and social demonstration goals. Social development goals involve a desire to grow and learn new things to develop one's social competence (Ryan & Shim, 2006). This could include learning how to best show support for a friend in a novel situation, or learning new details about another person. Improving one's social skills or developing stronger, more intimate relationships would indicate success at this type of goal. Social demonstration goals are divided into two subcategories: social demonstration-approach and social demonstration-avoid. Social demonstration-approach goals involve demonstrating social competence and being evaluated by others as desirable (Ryan & Shim, 2006). Social demonstration-avoid goals involve demonstrating that one does not lack social competence and attempting to avoid evaluations of undesirability.

Progress toward both kinds of demonstration goals is measured by examining the self relative to others; individuals seek to show that their social skills make them superior (or not inferior) to others, and receive positive feedback from others to affirm their social status. In contrast, development goals are self-referential; individuals with an orientation toward social development seek to become more socially adept than

they previously were. In other words, the comparison is with the former self, not with other people. Both of these types of goals are thought to affect how individuals interact with others and perceive themselves in social situations (Ryan & Shim, 2006, 2008). The goals are conceptualized as stable individual differences (although they can also be influenced by the social environment at times; Ryan & Shim, 2006; Ryan & Shim, 2008). Indeed, longitudinal data suggests that social achievement goal orientations are fairly stable over time (Ryan & Shim, 2006).

Existing research has examined social achievement goals among a variety of populations, including children (Rodkin, Ryan, Jamison, & Wilson, 2013), adolescents (e.g., Ryan & Shim, 2008) and young adults (Ryan & Shim, 2006; Shim, Wang, & Cassady, 2013), as well as across cultures (Liem, 2016). This work reveals that these goal orientations may have important implications for psychological, social, and academic outcomes. Higher social development goals are generally associated with better psychological and social adjustment (Rodkin et al., 2013; Ryan & Shim, 2006; Shim & Ryan, 2012). Individuals with these goals are more likely to engage in prosocial behavior (Rodkin et al., 2013) and enjoy a greater sense of social competence and peer acceptance (Ryan & Shim, 2006; Shim & Ryan, 2012). These results are not surprising, given that those with social development goals prioritize the development and maintenance of meaningful social relationships with others. Such goals should help to strengthen their relationships and elicit acceptance from their friends and social others. These self-reported associations noted above are also confirmed by observer reports indicating positive social adjustment (Ryan & Shim, 2006). Furthermore, development goals were related to more positive emotions, and may lead those with low self-esteem to experience fewer negative and more positive emotions (Shim et al., 2013). Social development goals may even have positive implications for other domains such as academics. Liem (2016) showed that development goals related to higher learning self-regulation and cooperative learning.

The outcomes of social demonstration goals differ based on whether they are demonstration-approach or demonstration-avoid goals. Individuals with stronger demonstration-avoid goals tend to have lower social efficacy and satisfaction with social relationships (Ryan & Shim, 2006), lower popularity among peers (Rodkin et al., 2013), and more negative emotions (Shim et al., 2013). On the other hand, individuals with stronger demonstration-approach goals tend to be high in aggression (Shim & Ryan, 2012) and, in some cases, social anxiety (Ryan & Shim, 2006). However, demonstration-approach goals also have some positive correlates such as greater joy (Shim et al., 2013), social competence, and popularity (Rodkin et al., 2013; Shim & Ryan, 2012). In summary, social development goals are generally associated with positive outcomes, social demonstration-avoid goals are generally related to adverse outcomes, and social demonstration-approach goals have both negative and positive outcomes.

1.2. Social achievement goals and social media

Although it has not yet been examined in a research context, there is reason to believe that social achievement goals could also have important implications for the way people engage with social media. We posit that social goal orientations should predict both how people use social media as well as different experiences from social media use.

People with social demonstration goals are more concerned with presenting a positive image of themselves (demonstration-approach), or avoiding a negative image of themselves (demonstration-avoid), rather than developing relationships with others (Ryan & Shim, 2006). Therefore, when using social media, they should be primarily concerned with engaging in ways that elicit attention from others, even if this occurs in a relatively superficial manner. For example, posts that show a large number of people how witty, insightful, or humorous they are would be an ideal way for a person with a demonstration-approach goal to engage with others on social media. Alternatively, posts that show a large number of people that they are not socially awkward, out of touch,

or inept would be an ideal way for a person with a demonstration-avoid goal to engage with others on social media. If a large audience does not notice their activity, then there would be less of an opportunity to demonstrate one's social competence. However, for those with a strong social development goal, posting an attention-grabbing quip on Twitter for hundreds (or more) to see would be unlikely to facilitate the development of a closer relationship with one's friends and is thus less likely to be appealing. Thus, the number of followers likely to see one's social media activity is unlikely to make a difference for those with a strong social development goal.

Alternatively, those with demonstration-avoid goals could potentially take a different approach to social media: withdrawal. If individuals do not contribute material to social media, there would be fewer opportunities for others to negatively critique their contributions. However, individuals may incur social costs if they were to withdraw from social media. Given the widespread popularity of social media (e.g., billions of users on a multitude of sites, such as Facebook, Instagram, and Twitter, among others), individuals who abstain could face unfavorable evaluations from their peers. That is, the absence of a social media presence could suggest a lack of social competence. Individuals could become isolated and unaware of others' activity, which could lead others to perceive them as out of touch and socially undesirable. Therefore, individuals with demonstration-avoid goals are not expected to withdraw from social media use entirely.

As mentioned above, although social demonstration-avoid goals are generally associated with negative outcomes, social demonstration-approach goals tend to have both positive and negative outcomes (Rodkin et al., 2013; Shim & Ryan, 2012). For example, there is reason to think that demonstration approach goals should join development goals in predicting certain types of engagement on social media, such as active posting and/or interactive engagement with others on social media. Active posting consists of posting content—such as a status update, picture, or comment— on a social media platform. Interactive engagement refers to social media activity in which individuals take part in a reciprocal exchange of information (e.g., messaging or posting back-and-forth). Active posting and interactive engagement are in contrast to passive activity, which is defined as viewing others' content on social media without contributing content oneself. An example of passive social media activity would be a person scrolling through others' posts and not adding any comments or new posts. On the other hand, social media use could involve acting as a more active participant by adding new content on social media (e.g., posting updates or pictures of oneself), or it could involve more interactive communications with others that would foster the maintenance or progression of relationships (e.g., sending private messages directly to others).

When individuals with development goals use social media, becoming more active and/or directly interacting with others (e.g., by posting on a friend's profile and/or sending private messages back and forth with other individuals, respectively) could give them opportunities to develop and/or maintain relationships with their friends. Exchanging a series of communications back and forth, in particular, would indicate a greater depth of interaction, which would facilitate one's social development goal. Indeed, individuals who are motivated to develop their relationships (i.e., individuals in intimate relationships, for example) may find ways to use online social interactions to further promote intimacy in their relationships (Jiang et al., 2013). Similarly, those with demonstration-approach goals should seek opportunities to display their popularity and social adeptness. Thus, they should be more likely to post content and engage with others, rather than simply passively observing others' activity. For example, posting a humorous meme on Facebook or posting an astute quote on Twitter would allow individuals to demonstrate their social skills to others. They could also exhibit their ability to adeptly engage in dialogue with others through a series of back-and-forth comments or messages, thereby demonstrating further range of their social skills. The ability to carry a conversation (via messaging) or generate a clever series of responses to a thread of

comments on a person's post could be other opportunities to demonstrate social competence. In contrast, simply passively viewing others' social media content would not provide any opportunities for these individuals to showcase their social aptitude. Therefore, one might expect individuals with strong development and/or demonstration-approach goals to be more likely to post more actively on social media (e.g., more status updates) and to use social media to progress or maintain their social relationships (e.g., greater back-and-forth messaging) manner.

Social demonstration goals may also relate to a feeling of social success and connection. Social media allow people to carefully craft content to present the self in the most favorable light (e.g., Cramer, Song, & Drent, 2016; Toma, Hancock, & Ellison, 2008), which is ideal for those with social demonstration goals. In addition, online interactions are often brief and superficial (e.g., posting a tweet under 280 characters), relative to in-person contact, but this should be sufficient to give individuals with demonstration goals a sense of connection and social success. Therefore, among those with high social demonstration goals, using social media should relate to a sense of social success.

In contrast, many common types of social media use, such as posting a picture on Instagram or scrolling through a series of tweets, are likely too superficial to build or maintain a strong sense of connection with friends. Therefore, these relatively superficial types of social media use should be insufficient to foster a sense of social connection among individuals high in development goals. This is not to suggest that individuals high in development goals refrain from all types of superficial social media *entirely*, especially considering the ubiquity of such activities such as tweeting or posting Instagram pictures. However, this would suggest that when individuals with social development goals consider their overall social media use (which may include deeper activity *and* frequent brief/superficial activities), this is not necessarily expected to engender a sense of social connection. Although using specific types of social media (e.g., private messaging), might predict a sense of social connection among those with social development goals, the same expectation would not be true of other social media use (e.g., posting a brief status update). Therefore, when considering their social media use on the whole, individuals with high social development goals are not necessarily expected to perceive that social media promotes a greater sense of social connection.

To adequately meet their social goals, individuals with strong development goals are likely to be focused on activities that consist of greater contact with others outside of social media. Specifically, social contact that occurs in person— or even speaking/texting with individuals or a small number of friends directly (e.g., Kross et al., 2013)— would be an effective route to achieving their social goals. Therefore, social development goals are expected to relate to spending more time on engaging in social interactions that occur in person or via conversing/texting on the phone.

1.3. Social media, social achievement goals, and similar constructs

Prior research has yet to examine the relationships among social achievement goals and social media. However, researchers have examined social media use and social outcomes in relation to similar constructs, such as self-esteem. Self-esteem is an evaluation of the one's general value and competence. Social achievement goals involve pursuing a sense of social competence. Therefore, there is considerable conceptual overlap of self-esteem and social achievement goals. Similar to the current research, prior researchers have frequently examined self-esteem in association with social outcomes (e.g., Baumeister, Campbell, Krueger, & Vohs, 2003; Leary, Tambor, Terdal, & Downs, 1995) such as a sense of social connection and acceptance. Social achievement goals focus on motivation toward social competence specifically, suggesting they may serve as unique predictors of social outcomes beyond general evaluations of the self (Shim & Ryan, 2012). In the current research, we sought to demonstrate that the influence of social achievement goals

was unique from that of self-esteem. Therefore, we included a measure of self-esteem to control for this construct in our analyses.

The extant literature examining relationships among self-esteem and social media use have shown mixed results. In some cases, social media use is associated with lower self-esteem (e.g., O'Dea & Campbell, 2011; Vogel, Rose, Roberts, & Eckles, 2014; Woods & Scott, 2016). In contrast, other research shows a positive association among (global or social) self-esteem and social media use (Apaolaza et al., 2013; Blomfield Neira & Barber, 2014; Gross, 2009; Senko et al., 2008; Valkenburg et al., 2006). Other work has not found social media use to predict self-esteem (Berry et al., 2018). Based on the lack of a clear pattern of a relationship with self-esteem, we did not make any specific predictions regarding the role of self-esteem in relation to social achievement goals and social media use. However, as noted above, self-esteem was included as a control variable in our analyses.

Additionally, we sought to examine whether social media activity was a function of social achievement goals specifically, or whether more general motivational tendencies could account for differences in social media activity. Approach motivation (or general activation) refers to humans' general motivational tendency to seek out positive, rewarding experiences, whereas avoidance motivation (or general inhibition) refers to the general motivational tendency to prevent negative experiences and inhibit negative affect (Elliot & Thrash, 2002; Gray, 1970). Therefore, social demonstration-approach and demonstration-avoid goals could be considered a subset of general approach/avoidance motivation. General approach/avoidance motivations have been shown to predict a number of psychosocial outcomes, such as daily positive and negative affect (Gable, Reis, & Elliot, 2000), social identification with others (Demaree, Robinson, Everhart, & Youngstrom, 2005), and emotional coping styles (Smits & Kuppens, 2005). Individuals with a strong tendency for approach in general might also have a strong tendency to approach rewarding social experiences. For example, individuals with a strong general approach motivation might be more likely to engage in active posting on social media (e.g., posting pictures, status updates, or tweets). Thus, we included measures of approach and avoidance motivation as control variables, to examine whether the influence of social demonstration-approach and demonstration-avoid goals can be explained by broader approach/avoidance goals.

2. Hypotheses

The current research draws on an established theoretical framework to focus on how individuals use social media in specific and unique ways that have not been previously examined. Social media applications are frequently changing and being updated, and it is advantageous for researchers to keep pace with these changes. Therefore, we initially generated several exploratory hypotheses regarding social achievement goals and specific types of social media use. After examining exploratory hypotheses in Study 1, we refined the following hypotheses and attempted to replicate our original results with a second study.

Hypothesis 1. Social demonstration-approach and demonstration-avoid goals will positively relate to social media activities that allow individuals to engage with a large number of people (i.e., posting/responding to content only if one believes a large number of people will see it and/or respond).

Hypothesis 2. Social development goals and social demonstration-approach goals will relate to greater active posting on social media (e.g., posting pictures, status updates, or tweets) and using social media to progress or maintain relationships.

Hypothesis 3. Social demonstration-approach and demonstration-avoid goals will relate to a greater sense of social connection with others when considering one's overall social media use (across all possible social media activity), as measured with the "feeling close to others while using social media" scale.

Hypothesis 4. Social development goals will be associated with greater social interactions with others that occur in person or via conversing/texting on the phone.

Furthermore, with the current research, we will control for constructs theoretically related to social achievement goals to ensure that we are examining the unique relationships between social achievement goals and social media use. Specifically, we will control for general approach/avoidance motivation. In addition, we will control for self-esteem because social achievement goals involve achieving a sense of social competence, which overlaps with the construct of self-esteem. In summary, to extend prior social achievement goal research that has not yet controlled for these constructs (e.g., Ryan & Shim, 2008), and provide further evidence that current outcomes (e.g., sense of social connection with others while using social media) are specifically related to the influence of social achievement goals, self-esteem and approach/avoidance goals will be included as covariates in the current studies.

3. Method

3.1. Participants and procedure

The procedures for Studies 1 and 2 were identical, as Study 2 was a direct replication of Study 1. Three hundred eighteen participants were recruited from introductory psychology courses for Study 1. Informed consent was obtained from all participants prior to their participation. All participants were required to have at least one social media account to be eligible to participate. Four participants were excluded from analyses for reporting poor English fluency or reporting invalid responses, leaving a total of 314. The current research utilized several unique outcome variable items based on novel questions that are the focus of the current research. Because these have not been well studied in prior research, we were unable to conduct a precise a priori power analysis for the first study. For Study 2, 473 participants were recruited to provide improved power to attempt to replicate Study 1. Five participants were excluded from analyses for reporting poor English fluency, leaving a total of 468. An a priori power analysis revealed this to be sufficient for the planned regression analyses. Participants received course credit for their participation.

The majority of participants in Study 1 were women (53.8%), reported their race as European/European American (43.9%) or Asian/Asian American (28.7%), and reported a mean age of 18.93 years ($SD = 1.30$). Participants reported having an average of 3.9 social media accounts and reported using social media "several times *per* day" or more, on average. Similar demographics were reported in Study 2 in terms of age ($M = 19.03$, $SD = 1.59$) and race, (European/European American: 56.6%; Asian/Asian American: 24.2%), with a slightly higher proportion of men (56.8%). Study 2 participants reported having an average of 3.7 social media accounts and reported using social media "several times a day" or more, on average.

Participants came to the research lab to participate, and were seated in front of computers in semi-private cubicles. Participants completed self-report questionnaires to assess background information (e.g., age, gender) and the principal variables of interest, as described below. After completing these questionnaires, participants were fully debriefed and thanked for their time.

3.2. Measures

Social achievement goals. The 12-item Ryan and Shim (2006) scale was used to measure social development (e.g., "In general, I strive to develop my interpersonal skills"; Study 1 α = 0.70, Study 2 α = 0.77), social demonstration-approach (e.g., "It is important to me to have "cool" friends"; Study 1 α = 0.87, Study 2 α = 0.88), and social demonstration-avoid goals (e.g., "My goal is to avoid doing things that

would cause others to make fun of me"; Study 1 α = 0.71, Study 2 α = 0.74). Participants responded to items on 5-point scales (1 = *Not at all true* to 5 = *Very true*).

Social media use: general. Participants' frequency and manner of social media use were assessed using several items that were uniquely generated for the current research. Participants first reported which social media applications they used (e.g., Instagram, Twitter, Facebook) and how often they used them (1 = *Never* to 8 = *Several times per hour*).

Active social media posting. A 3-item scale was used to assess participants' active social media posting (Study 1 α = 0.78, Study 2 α = 0.70). Participants responded to items ("While using social media, how often do you create and post your own text to your page, such as status updates and tweets?"; "While using social media, how often do you post pictures?"; "While using social media, how often do you post information about what you are doing or whom you are with?") on 7-point scales (1 = *Never* to 7 = *Very often*).

Social media to progress/maintain relationships. A 7-item scale was used to tap into other specific ways that individuals might use social media, such as having repeated interactions with the same person/people (Study 1 α = 0.81, Study 2 α = 0.74). Participants responded to items (e.g., "While using social media, how often do you have repeated contact with the same person? For example, this may include messaging, commenting on posts, or sending snaps back and forth") on 7-point scales (1 = *Never* to 7 = *Very often*).

Social media: popular posts. A single item was used to assess whether individuals decide to post based on expected popularity ("I will only post or respond to content on social media if I believe a lot of other people will see and/or respond to it"; 1 = *Strongly disagree* to 7 = *Strongly agree*).

Social media: feeling close to others while using social media. A 3-item scale was used to assess how social media use affects individuals' perceptions of their social relationships following social media use (Study 1 α = 0.74, Study 2 α = 0.68). This measures the extent to which individuals feel close to friends while using social media. Participants responded to items (e.g., "I feel like I have a strong relationship with my friends when I am interacting with them on social media") on 7-point scales (1 = *Strongly disagree* to 7 = *Strongly agree*).

In-person or calling/texting social contact. A 5-item scale was used to assess how often individuals spent time with others in person or via calling/texting (Study 1 α = 0.62, Study 2 α = 0.61). Participants responded to items (e.g., "How often do you spend your leisure time with friends, in person?") on 7-point scales (1 = *Never* to 7 = *Very often*). This included items regarding interactions that took place in person or over the phone (i.e., calling or texting).

General inhibition/activation motivation. The behavioral inhibition scale (BIS) and behavioral activation scales (BAS; Carver & White, 1994) were used to measure general dispositions toward inhibition and activation. BIS (e.g., "I worry about making mistakes"; Study 1 α = 0.62, Study 2 α = 0.63) and BAS (e.g., "When I get something I want, I feel excited and energized"; Study 1 α = 0.85, Study 2 α = 0.82) items were assessed on 4-point scales (1 = *Very false for me* to 4 = *Very true for me*).

Self-esteem. The 10-item Rosenberg (1965) scale was used to tap participants' self-esteem (Study 1 α = 0.90, Study 2 α = 0.90). Participants responded to items (e.g., "I feel that I am a person of worth, at least on an equal basis with others") on 7-point scales (1 = *Strongly disagree* to 7 = *Strongly agree*).

4. Results

4.1. Correlations and regressions

Descriptive statistics of social media use (i.e., reports of having particular social media accounts and the frequency of use in the past week) are reported in Table 1. We first examined the correlations among relevant variables (see Tables 2 and 3), which were consistent with expectations. For example, there were moderate, positive correlations between development/demonstration-approach goals and active social

Table 1
Social media use.

		Have an account	Used account in last week
Study 1	Instagram	93.0%	92.7%
	Snapchat	93.6%	93.9%
	Facebook	83.8%	73.6%
	Twitter	59.9%	54.1%
	Pinterest	36.3%	28.3%
	Tumblr	21.3%	14.0%
Study 2	Instagram	92.1%	91.0%
	Snapchat	93.4%	93.4%
	Facebook	74.8%	66.6%
	Twitter	64.1%	59.5%
	Pinterest	28.2%	24.5%
	Tumblr	16.9%	12.7%

media posting; and there were moderate, positive correlations between demonstration-approach/demonstration-avoid goals and popular posting on social media (i.e., "posting on social media only if a post is expected to be popular"). Thus, the correlations strongly suggest that these are related, yet distinct constructs.

Next, a series of regression analyses was used to test the hypotheses for Studies 1 and 2. The first hypothesis states that social demonstration-approach and demonstration-avoid goals will positively relate to social media activities that allow individuals to engage with a large number of people. To examine this hypothesis, we regressed the item "I will only post or respond to content on social media if I believe a lot of other people will see and/or respond to it" on the three social achievement goals (see Table 4). Study 1 analyses revealed social demonstration-approach (β = 0.24, $p < .001$ (CI: 0.12-0.36)) and social demonstration-avoid (β = 0.14, $p = .018$ (CI: 0.03-0.26)) goals as significant, positive predictors. Similar results were found in Study 2 for social demonstration-approach (β = 0.22, $p < .001$ (CI: 0.12-0.31)) and social demonstration-avoid (β = 0.20, $p < .001$ (CI: 0.10-0.29)) goals. Social development goals were not significant predictors in either study. We also regressed the item "I will only post or respond to content on social media if I believe a lot of other people will see and/or respond to it" on the three social achievement goals, along with the BIS and BAS scales as covariates. The same pattern of results also held when controlling for BIS/BAS, with the exception of demonstration-avoid goals dropping below significance in Study 1 ($p = .11$). Also, we regressed the item "I will only post or respond to content on social media if I believe a lot of other people will see and/or respond to it" on the three social achievement goals, along with the self-esteem scale as a covariate. When controlling for self-esteem in a separate regression, demonstration-avoid goals were no longer a significant predictor in Study 1 ($p = .12$). However, demonstration-avoid goals remained significant in Study 2 (which had greater statistical power), regardless of whether general approach/avoidance motivation or self-esteem was included in the model. These regressions are consistent with the first hypothesis and suggest that people with social demonstration goals were interested in demonstrating social competence by posting to a wide audience.

The second hypothesis states that social development goals and social demonstration-approach goals will relate to greater active posting on social media and using social media to progress or maintain relationships. To test this hypothesis, we examined two different outcome variables in separate regressions. First, we regressed the active social media posting scale on the three social achievement goals (see Table 5). Study 1 results revealed both development (β = 0.18, $p = .001$ (CI: 0.08-0.26)) and demonstration-approach (β = 0.22, $p < .001$ (CI: 0.09-0.29)) goals, but not demonstration-avoid goals, as significant, positive predictors. The same pattern was found in Study 2 for development (β = 0.17, $p < .001$ (CI: 0.08-0.26)) and demonstration-approach (β = 0.19, $p < .001$ (CI: 0.09-0.29)) goals. We also regressed the active social media posting scale on the three social achievement goals, along with the BIS and BAS scales as covariates. The same pattern of results held when

Table 2
Study 1 Pearson correlations among social achievement goals and social media use.

	1	2	3	4	5	6	7	8	9	10	11
1. Develop Goal	–										
2. Dem-App Goal	.04	–									
3. Dem-Avoid Goal	.00	.42***	–								
4. Active SM	.19**	.21***	.06	–							
5. SM Progress	.27***	.18**	.05	.38***	–						
6. Close SMrowhead	.08	.27***	.18**	.31***	.63***	–					
7. In-person Contact	.25***	.08	-.03	.26***	.45***	.23***	–				
8. Pop Post	.00	.30***	.24***	.10	.14*	.21***	.04	–			
9. BAS	.39***	.08	-.04	.12**	.27***	.13*	.32***	.09	–		
10. BIS	.03	.16**	.40***	.15**	.20***	.30***	.07	.20***	.06	–	
11. Self-Esteem	.23***	-.07	-.26 ***	-.01	.03	-.08	.15*	-.07	.19**	-.36***	–
Mean	4.21	2.37	2.69	3.01	4.90	3.88	5.03	3.28	3.22	2.80	4.81
SD	0.59	1.00	0.89	1.29	1.23	1.40	1.01	1.75	0.45	0.56	1.11

Notes: Develop Goal = Social development goal; Dem-App Goal = Social demonstration approach goal; Dem-Avoid Goal = Social demonstration avoid goal; Active SM = Active social media posting; SM progress = Using social media to progress or maintain relationships; Close SM = Feeling close to others while using SM; In-person Contact = Contact with others that occurs i n person or via calling/texting; Pop Post = Posting on social media only if a post is expected to be popular; BAS = Behavioral Activation Scale; BIS = Behavioral Inhibition Scale; *p < .05; **p < .01; ***p < .001.

Table 3
Study 2 Pearson correlations among social achievement goals and social media use.

	1	2	3	4	5	6	7	8	9	10	11
1. Develop Goal	–										
2. Dem-App Goal	.09	–									
3. Dem-Avoid Goal	-.09	.42***	–								
4. Active SM	.19***	.20***	.05	–							
5. SM Progress	.28***	.17***	.08	.29***	–						
6. Close SM	.09	.20***	.19***	.19***	.55***	–					
7. In-person Contact	.21***	.04	-.09*	.15**	.32***	.10*	–				
8. Pop Post	.00	.30***	.29***	.13**	.06	.15**	.10*	–			
9. BAS	.38***	.09	-.12*	.16**	.27***	.06	.22***	.19***	–		
10. BIS	.09*	.10*	.40***	.15**	.16**	.13**	.08	.19***	.09	–	
11. Self-Esteem	.11*	-.02	-.25 ***	-.03	.05	.12*	.11*	-.03	.13*	-.31	–
Mean	4.23	2.30	2.65	2.88	4.81	3.81	4.81	3.19	3.14	2.76	4.86
SD	0.61	0.98	0.95	1.09	1.13	1.24	1.04	1.69	0.43	0.55	1.14

Notes: Develop Goal = Social development goal; Dem-App Goal = Social demonstration approach goal; Dem-Avoid Goal = Social demonstration avoid goal; Active SM = Active social media posting; SM progress = Using social media to progress or maintain relationships; Close SM = Feeling close to others while using SM; In-person Contact = Contact with others that occurs in person or via calling/texting; Pop Post = Posting on social media only if a post is expected to be popular; BAS = Behavioral Activation Scale; BIS = Behavioral Inhibition Scale; *p < .05; **p < .01; ***p < .001.

Table 4
Hypothesis 1 Regression Analyses: "I will only post or respond to content on social media if I believe a lot of other people will see and/or respond to it" item regressed on Social Achievement Goals.

		β	p	95% CI
Study 1	Develop Goal	-.01	.91	-.20 - .18
	Dem-App Goal	.24	<.001	.12–.36
	Dem-Avoid Goal	.14	.018	.03–.26
Study 2	Develop Goal	.00	.98	-.20 - .18
	Dem-App Goal	.22	<.001	.21–.62
	Dem-Avoid Goal	.20	<.001	.04–.45

Notes: Develop Goal = Social development goal; Dem-App Goal = Social demonstration approach goal; Dem-Avoid Goal = Social demonstration avoid goal.

Table 5
Hypothesis 2 Regression Analyses: Active Social Media Posting Scale regressed on Social Achievement Goals.

		β	p	95% CI
Study 1	Develop Goal	.18	.001	.10–.37
	Dem-App Goal	.22	<.001	.13–43
	Dem-Avoid Goal	-.03	.60	-.19 - .11
Study 2	Develop Goal	.17	<.001	.09–.29
	Dem-App Goal	.19	<.001	.10–32
	Dem-Avoid Goal	-.01	.80	-.12 - .09

Table 6
Hypothesis 2 Regression Analyses: Social Media to Progress/Maintain Relationships Scale regressed on Social Achievement Goals.

		β	p	95% CI
Study 1	Develop Goal	.26	<.001	.19–.45
	Dem-App Goal	.18	.003	.07–.36
	Dem-Avoid Goal	-.02	.71	-.17 - .12
Study 2	Develop Goal	.28	<.001	.22–.41
	Dem-App Goal	.12	.02	.03–.24
	Dem-Avoid Goal	.06	.25	-.05 - .17

controlling for BIS/BAS. We also regressed the active social media posting scale on the three social achievement goals, along with the self-esteem scale as a covariate in a separate regression. The same pattern of results held when controlling for self-esteem.

We also assessed another outcome variable: using social media to progress/maintain relationships. This scale was regressed on the three social achievement goals (see Table 6). In Study 1, development (β = 0.26, p < .001 (CI: 0.15-0.37)) and demonstration-approach (β = 0.18, p = .003 (CI: 0.06-0.29)) goals were significant and positively related to

using social media to progress or maintain relationships. These effects replicated in Study 2 for development (β = 0.28, *p* < .001 (CI: 0.19-0.37)) and demonstration-approach (β = 0.12, *p* = .016 (CI: 0.02-0.21)) goals. Demonstration-avoid goals were not significant predictors in either study. We also regressed the "using social media to progress/maintain relationships" scale on the three social achievement goals, along with BIS and BAS scales as covariates. The same pattern of results held when controlling for BIS/BAS. We also regressed the "using social media to progress/maintain relationships" scale on the three social achievement goals, along with the self-esteem scale as a covariate in a separate regression. The same pattern of results held when controlling for self-esteem.

Both of these sets of regressions— examining the active social media posting scale and social media to progress/maintain relationships scale as outcomes— were consistent with the second hypothesis. Social development and social demonstration-approach goals were significant, positive predictors of both types of social media use. Individuals with social demonstration-approach and development goals seek out social interactions and hope to cultivate their relationships, which can be accomplished with greater active and deeper social activity. These analyses suggest that individuals with social development and demonstration-approach goals are more likely to use social media in these ways, as a tool to accomplish their social goals.

The third hypothesis states that social demonstration-approach and demonstration-avoid goals will relate to a greater sense of social connection with others when considering one's overall social media use. To test this hypothesis, the "feeling close to others while using social media" scale was regressed on the three social achievement goals (see Table 7). Results from Study 1 indicated that social demonstration-approach goals were a significant predictor (β = 0.23, *p* < .001 (CI: 0.11-0.35)), whereas social demonstration-avoid goals were trending in the same direction, but fell short of statistical significance (β = 0.08, *p* = .16 (CI: 0.03-0.20)). In Study 2, demonstration-approach (β = 0.14, *p* = .006 (CI: 0.05-0.29)) and demonstration-avoid (β = 0.14, *p* = .007 (CI: 0.04-0.23)) goals were both significant predictors of feeling close to others while using social media. Social development goals were not a significant predictor in either study. We also regressed the "feeling close to others while using social media" scale on the three social achievement goals, along with BIS and BAS scales as covariates. The same pattern of results held when controlling for BIS/BAS. We also regressed the "feeling close to others while using social media" scale on the three social achievement goals, along with self-esteem as a covariate in a separate regression. The same pattern of results held when controlling for self-esteem, although development goals surprisingly became a significant predictor in Study 2 (β = 0.10, *p* = .04 (CI: 0.007-0.26)) with self-esteem included in the model. In summary, the fourth set of regressions was consistent with our third hypothesis; social demonstration-approach and demonstration-avoid goals were both positively related to feeling close to others while using social media. In contrast, the same associations were not found among those with social development goals.

The fourth hypothesis states that social development goals will be associated with greater social interactions with others that occur in person or via conversing/texting on the phone. To examine this hypothesis, we regressed the "in-person or calling/texting social contact" scale on the three social achievement goals (see Table 8). Study 1 analyses revealed social development (β = 0.25, *p* < .001 (CI: 0.14-0.35)) goals— but neither demonstration goals— as a significant and positive predictor. We also regressed the "in-person or calling/texting social contact" scale on the three social achievement goals, along with self-esteem as a covariate, and found the same pattern of results in Study 1. Development goals were also significant in Study 2 (β = 0.19, *p* < .001 (CI: 0.10-0.28)). Surprisingly, demonstration-avoid goals were also significant (β = −0.10, *p* = .044 (CI: 0.20 to −0.003)) in Study 2. We also regressed the "in-person or calling/texting social contact" scale on the three social achievement goals, along with self-esteem as a covariate, and it should be noted that the demonstration-avoid goals were no longer significant predictors when self-esteem was included in the regression (*p* = .20) in Study 2. Thus, the findings for demonstration-avoid goals should be interpreted with some caution, considering that it only narrowly met the significance threshold in a well-powered study when not controlling for self-esteem, and demonstration-avoid goals were not a significant predictor in Study 1. We also regressed the "in-person or calling/texting social contact" scale on the three social achievement goals, along with BIS/BAS as covariates. The same overall pattern of results also held when controlling for BIS/BAS in a separate regression. Results were thus highly consistent with the fourth hypothesis that people with social development goals were more interested in social interactions with others that consist of direct contact in-person or via conversing or texting over the phone.

5. General discussion

Social media use is a ubiquitous part of modern life (Turkle, 2011), and the current research adds to the growing body of literature that seeks to further our understanding of how and why people use it, as well as perceptions of social connections that relate to its use. The current work drew from a social achievement goal theory perspective and extended it to a domain that had been previously unexplored from this perspective. Specifically, we focused on how individuals might engage in specific types of social media behaviors that correspond with their social achievement goals and the kinds of outcomes they would seek from social media (and non-social media) use.

Results from two independent samples supported the current hypotheses. First, we found that individuals with stronger demonstration-approach and demonstration-avoid goals were more likely to only post or respond to content on social media if they believed many other people would see and/or respond to it. These analyses suggest that demonstration (but not necessarily development) goals relate to social media activity that allows individuals to connect with a wide audience. Social demonstration goals involve striving to attain more positive (and fewer negative) evaluations from others (Ryan & Shim, 2006). Social media should be an ideal route to achieving these goals, but this may only apply to certain types of social media activity. The current results indicate that this applies to types of social media activity that allow individuals to display their social skills to a large number of people. For example, sending a snap to a few close friends may not necessarily facilitate the belief that one is popular and cool among his/her peers,

Table 7
Hypothesis 3 Regression Analyses: Feeling Close to Others While Using Social Media Scale regressed on Social Achievement Goals.

		β	*p*	95% CI
Study 1	Develop Goal	.07	.22	-.06 - .24
	Dem-App Goal	.23	<.001	.16–49
	Dem-Avoid Goal	.08	.16	-.05 - .28
Study 2	Develop Goal	.09	.06	.002–.22
	Dem-App Goal	.14	.006	.05–.29
	Dem-Avoid Goal	.14	.007	.05–.29

Table 8
Hypothesis 4 Regression Analyses: In-Person or Calling/Texting Social Contact Scale regressed on Social Achievement Goals.

		β	*p*	95% CI
Study 1	Develop Goal	.25	<.001	.14–.36
	Dem-App Goal	.10	.10	-.02 - .22
	Dem-Avoid Goal	-.07	.22	-.19 - .05
Study 2	Develop Goal	.19	<.001	.11–.29
	Dem-App Goal	.06	.21	-.04 - .17
	Dem-Avoid Goal	-.10	.04	-.21–−.003

even if that picture portrayed the self in a favorable light. In contrast, advertising a flattering picture of the self to hundreds of people would be more likely to make one feel as though they had accomplished their social demonstration goals. These results could suggest that young adults seek to display a sense of social competence in ways that were unavailable 20 or even 10 years ago. Prior to the advent of prevalent social media, demonstrating one's social skills and popularity in front of a small group of people may have been sufficient to satisfy a social demonstration-approach goal. In present day, social media allow people to easily reach dozens or hundreds of people, and individuals may feel as though they must reach a large audience to feel popular.

Our second hypothesis— that development and demonstration-approach goals would be related to greater active posting on social media and using social media to progress or maintain relationships— was also supported. Thus, social development and demonstration approach goals were related to greater active posting and more interactive, deeper activity online – just the kind one would need to truly connect with other people. Indeed, it would be nearly impossible for those with development goals to cultivate strong relationships by simply passively viewing others' content on social media or sending a single message to a friend. Rather, these individuals should be likely to actively post their own material, add comments on others' posts, or engage in back-and-forth messages with their friends, because those social media activities would provide an opportunity to further enrich their social relationships. This suggests that individuals with strong social development goals are adapting to new forms of communication and utilizing them in ways that best match with their goals. Although some social media features may not be effective for cultivating relationships, individuals are adapting to media platforms to meet their needs. For instance, even though millions of people may commonly use Twitter to follow others, and view/like their tweets, individuals with social development goals appear to be inclined to make use of other features that are better suited to satisfying their social goals.

Similarly, individuals with demonstration-approach goals should not be interested in merely scrolling through the online content of their social network members. Rather, these individuals should be likely to share pictures, reply to group message threads, or comment several times on a friend's post, because that behavior would give individuals opportunities to display their social skills and increase perceptions that others view them (and their social media prowess) in a positive light. The current analyses suggest that individuals with social development and demonstration-approach goals are more likely to use social media as tools in these specific ways to accomplish their social goals.

The next set of analyses revealed social demonstration-approach and demonstration-avoid goals as significant, positive predictors of feeling close to others while using social media. At first look, it may appear surprising that social media use would foster feelings of closeness with others, given that many common ways of using social media (e.g., liking another person's picture on Instagram or posting a brief video onto one's Snapchat story) are often relatively superficial compared to in-person interactions. Yet for individuals with strong social demonstration goals, social media activity can be an ideal route for demonstrating one's social competence and thereby feeling a sense of connection with others. When crafting a comment or choosing a filter for one's selfie, people have a great deal of control over how they present themselves to others (e.g., Cramer et al., 2016; Toma et al., 2008). Engaging with others on social media platforms can promote the perception that one is attractive, witty, and popular. Armed with beliefs of one's social aptitude, individuals could feel that others value them and feel a stronger connection with others after interacting with them on social media. Thus, the combination of social demonstration goals and social media use promotes feelings of social connection with others. This suggests that the ability of social media to promote a sense of belonging may depend on one's social achievement goal orientations.

The last set of results showed that social development goals were related to greater contact with others that involved meeting in person,

calling and/or texting. Although demonstration goals may promote feelings of social connection while using social media (as discussed above), the present results suggest that in-person contact may be important for those with development goals. Individuals with development goals seek to develop closer, more intimate social relationships. Social interactions that take place in person or via calling/texting should be better suited to achieve these goals, compared to relatively superficial interactions on social media. The current results could suggest that social media activity alone is insufficient for achieving development goals, and therefore these individuals also seek in-person social interactions. This indicates that social media interactions and other types of interactions may each play a role in increasing connections to others, depending on individual differences in motivational tendencies.

Social media provide a variety of ways for individuals to express themselves and interact with others. Collectively, the current research helps us to better understand the reasons underlying individuals' choices for engaging in different social media activities. Individuals with stronger demonstration-approach and demonstration-avoid goals seek to show off their social skills to a wide audience. This leads them to selectively post content only when it will reach a large number of people; and by connecting with others on social media, the current results suggest that these individuals tend to feel as though they have accomplished their social goals, leading them to feel close to others. As social media continues to expand and include new features, our work suggests that we can expect individuals with demonstration-approach and demonstration-avoid goals to continue to be drawn to novel features of this nature—features and apps that allow them to reach as many people as possible.

However, for individuals with strong social development goals, certain types of social media activity (e.g., posting a status update, scanning through others' tweets) could potentially seem relatively shallow and insufficient for developing meaningful connections with close others. Whereas the current studies did not reveal social development goals to be a significant predictor of feeling close to others while using social media (overall), interacting in person or via calling/texting would lend to developing greater intimacy with others. Thus, development goals were associated with greater non-social media contact. Yet given the prevalence of social media in modern life (Turkle, 2011), we would not expect these individuals to completely refrain from all social media use. Rather, individuals should engage with others in a manner that is consistent with their social goals. The current results suggest that those with development (and demonstration-approach) goals utilize social media in ways that allow them to proactively engage with others, thus giving them more opportunities to maintain their social connections. This type of activity would be preferable to other types of social media behavior, such as scrolling through their Facebook newsfeed, viewing snaps from others on Snapchat, or browsing through others' Twitter posts. Such passive social media behavior (e.g., Escobar-Viera et al., 2018) would not necessarily facilitate individuals' ability to build and deepen their relationships with others, but some degree of back-and-forth interaction would fit with the development goal. Similarly, initiating contact by creating a post or responding to others' posts or messages to continue an interaction is consistent with a social demonstration goal. If one were to limit social media activity to simply viewing others' media, there would be little opportunity to demonstrate one's popularity and social skills.

5.1. Limitations and future directions

One important limitation of the current research is that the data were correlational. Therefore, we are unable to make conclusions regarding any causal relationships. Although we believe social achievement goals likely predict the types of social media behavior examined here, the reverse may also be true. For instance, if a person were to actively post on social media and receive positive feedback from a large social network, this could encourage them to continue demonstrating their

clever sense of humor (or other social competencies), and consequently adopt a social demonstration-approach goal. Future research could examine whether social goals predict social media outcomes longitudinally.

Additionally, it may appear as though the analyses pertaining to hypotheses 2 and 3 are somewhat at odds. That is, if individuals with social development goals use social media in certain ways to progress their relationships, would that not suggest that social development goals should also positively predict a sense of social connection while using social media? First, we seek to avoid drawing conclusions based on null results (i.e., social development goals were not significantly related to feeling a sense of social connection while using social media in either study), as there are multiple potential explanations for this null finding. Second, it is possible that individuals with strong development goals may feel closer to others when using social media in some cases, but only if they use social media in a particular manner—such as by engaging in deeper or more interactive social media activities. The current measure of "feeling a greater sense of social connection with others while using social media" did not differentiate among different types of social media use. Therefore, the current participants with development goals may have been considering common social media activities that are relatively superficial or passive, along with more active, deeper forms of social media use, in which case such social media use overall would not be expected to relate to a greater sense of social connection. Future research could examine whether individuals with social development goals experience a sense of social connection when asked about more specific types of social media use.

Future research could also take a more fine-grained look into how social goals relate to specific types of social media behavior. For instance, people may use several different social media applications. The current research did not distinguish between individuals' preferences for all possible available applications or features. Perhaps a strong social development goal orientation would create a preference for Snapstreaks with friends (in which friends exchange pictures on Snapchat within 24 h for 4 or more consecutive days), which could be construed as evidence of a relatively deep social bond. New social media features and applications are continually being developed, and future researchers will have opportunities to investigate these in relation to social goals. For instance, it would be interesting to investigate whether individuals with strong social development goals might be more inclined to use new social media apps that are being developed specifically to maintain connections with smaller groups of close others (e.g., Cocoon, under development; C. Walsh, personal communication, February 7, 2019), rather than apps such as Twitter that are intended for a wider audience.

Another potential concern regards the phrasing of the novel measures that were created to assess social media use for the current study. For example, participants were asked to report on how social media affected their perceptions of their social relationships following social media use (e.g., "I feel like I have a strong relationship with my *friends* [italics added] when I am interacting with them on social media"). Some participants may have interpreted "friends" to refer to individuals who are listed as their "friends" on Facebook or other social media platforms, whereas others may have interpreted the term "friends" differently. Future research could more clearly specify these terms to avoid any differences of interpretation by different participants.

The current work relied on a sample of undergraduate students of similar age (Study 1 *M* age = 18.93 years, *SD* = 1.30; Study 2 *M* age = 19.03, *SD* = 1.59). Thus, we report results from a sample of individuals who are best described as being in the developmental period of emerging adulthood (ages 18–25; Arnett, 2000). Although psychologists sometimes regard these individuals as unique in their development and psychological functioning, we do not feel the results of this study are applicable only to this age group. It is worth noting that social media is used widely by individuals of various age ranges (Turkle, 2011), and therefore is not exclusive to the emerging adult demographic. However, future work can help to widen this research to a broader context by utilizing a more age-diverse sample of participants.

5.2. Conclusion

The current research extends existing work on social achievement goals to a novel domain: social media. Earlier social achievement goal research focused on outcomes directly related to these goals, such as perceived social competence, peer acceptance (Ryan & Shim, 2006; Shim & Ryan, 2012), and also academic outcomes (Liem, 2016). The current results suggest that social achievement goals may also improve our understanding of individuals' reasons for engaging in specific social media behaviors. Depending on the motivation and manner in which one uses social networks, these media have the potential to influence a range of social experiences, from increasing one's popularity to maintaining social bonds with a distant relative.

Data Statement

The authors are willing to share their data, analytics methods, and study materials with other researchers. The materials are available upon request.

Declaration of competing interest

None.

CRediT authorship contribution statement

Craig S. Brinkman: Conceptualization, Methodology, Software, Formal analysis, Investigation, Resources, Data curation, Writing - original draft, Visualization. **Shira Gabriel:** Conceptualization, Methodology, Resources, Writing - original draft. **Elaine Paravati:** Investigation, Resources, Data curation, Writing - original draft.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.chb.2020.106427.

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