

# I Would Like To..., I Shouldn't..., I Wish I...: Exploring Behavior-Change Goals for Social Networking Sites

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## ABSTRACT

Despite the benefits they derive from social networking sites (SNSs), members of those services are not always satisfied with their online behaviors. The investigation of desires for behavior change in SNSs both provide insight into users' perceptions of how SNSs impact their lives (positively or negatively) and can inform tools for helping users achieve desired behavior changes. We use a 604-participant online survey to explore SNS users' behavior-change goals for Facebook, Instagram, and Twitter. While some participants want to reduce site use, others want to improve their use or increase a range of behaviors. These desired changes differ by SNS, and, for Twitter, by participants' levels of site use. Participants also expect a range of benefits from these goals, including more free time, contact with others, intrinsic benefits, better security/privacy, and improved self presentation. Based on these results we provide insights both into how participants perceive different SNSs, as well as potential designs for behavior-change mechanisms to target SNS behaviors.

## Author Keywords

goals; social networking sites; Facebook; Twitter; Instagram; survey

## ACM Classification Keywords

H.5.m. Information Interfaces and Presentation (e.g. HCI): Miscellaneous

## INTRODUCTION

Social networking sites (SNSs) provide many benefits including entertainment, information, and tools for staying in touch with others. However, as in other areas of life like health or finance, people are not always satisfied with how they use SNSs. Just as people sometimes want to eat less junk food or save more money, SNS users also sometimes want to change their behaviors on the sites. Some want to try to increase perceived benefits, while others want to avoid perceived downsides of SNS use.

We use a 604-participant online survey of SNS-behavior-change goals to examine how SNS users want to change their behaviors on Facebook, Instagram, and Twitter. Just as goals for improving health- or finance-related behaviors relate to how people see health or finance impacting their lives, looking at participants' behavior-change goals provides insights into how they view SNSs as potentially enhancing their lives or as being potentially detrimental. We also compare participant goals across Facebook, Instagram, and Twitter, and find differences in how participants view the three sites.

Different types of goals require different approaches. Thus, we look at participants' goals from the perspective of designing for behavior change, and draw on persuasive design techniques, like the Fogg Behavior Model [8], to explore how different levers could be applied to help participants achieve different types of goals.

We provide two primary contributions. We expand on prior work on perceived benefits and tradeoffs of SNSs (e.g., [11, 26, 24, 4]) by using behavior-change goals to explore how people view SNSs as impacting their lives, and by describing the range of goals participants have. We also compare perceived benefits and downsides across Facebook, Instagram, and Twitter. Additionally, we draw on the Fogg Behavior Model (FBM) to provide insight into persuasive-design levers that could be incorporated into mechanisms to help users achieve SNS-behavior-change goals. We specifically address the following research questions:

- Q1: What types of behavior-change goals do participants have for their SNS use? How do these vary by SNS? By user activity level?
- Q2: How difficult and important do participants perceive these goals to be?
- Q3: How do participants believe they could achieve these goals? What steps do they think are necessary?

Many participants view SNSs as beneficial and want to increase use or posting to obtain benefits like increased contact with others, improved self-presentation, or more attention. However, some participants see SNSs as detracting from their lives and want to use them less or better, often to free up time or reduce potential for security/privacy or self-presentation issues. We see some differences in goals described by participants for the SNSs, and for Twitter participants with different

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levels of site use. Participants also described barriers and facilitators, as well as steps to achieve their goals, which could inform SNS-behavior-change tools.

## RELATED WORK

SNSs are an emerging part of peoples' lives and provide a range of benefits. However, user actions sometimes result in regret or other sub-optimal outcomes like unnecessary self-censorship or over-sharing. Persuasive design and goals theory provide insight into mechanisms to address behaviors users wish to change.

### Uses and benefits of SNS

SNSs like Facebook, Instagram, and Twitter provide a range of uses and benefits. People use Facebook to connect and chat with others, post photos and updates, for games and apps, to look up others, to pass time, for entertainment, and for professional connections [17, 11]. They also use the site to ask for and provide social support [26].

Different motives for using Facebook predict use of different features and different actions [24], and various uses also result in different benefits. Receiving directed messages on Facebook, for example, was associated with increased bridging social capital, while passively reading the site was only associated with an increase in social capital for users with lower communication skills [4]. Similarly, on Twitter, a sense of "connection" increased with use of the site, but increased more if users tweeted [5].

We provide an expanded view on SNS uses and benefits by examining SNS-behavior-change goals. Eliciting and exploring a range of goals for SNS-behavior change allows us to explore the full range of perceived current or potential impacts of SNS-use, including perceived benefits as well as perceived downsides. We also contribute by comparing these goals across Facebook, Instagram, and Twitter, demonstrating differences in perceptions of the three SNSs.

### Suboptimal behaviors on SNSs

SNS users also sometimes behave in ways they might want to change, motivating behavior-change goals. These goals may be prompted by the unique contexts and affordances—or lack thereof—presented by SNSs. For example, "context collapse," the need to communicate with different groups, and allowances for broadcast communications, can make it difficult for users to properly determine audiences, and can prompt coping behaviors [12, 15, 27]. Regret can arise when SNS users' posts are viewed by unintended audiences, from unforeseen consequences, or when users violate social norms, post critical messages, post in highly emotional states, or post content that reveals too much [23, 29].

Users also sometimes employ coping strategies to try to avoid regret, which they may consider successful or suboptimal. For example, users sometimes self-censor content that they might benefit from sharing with at least some people [12, 22, 6, 27]. Similarly, some people may wish to share health struggles or successes via SNSs but choose not to do so because of a fear of boring others or appearing boastful [16]. Users also sometimes delete content after posting [1] or engage in

extra profile management [21]. While these may be appropriate or desired strategies in some cases, at other times users may wish to adjust, or eliminate the need for, these behaviors. This dynamic may be reflected in behavior-change goals.

Different people may seek to avoid different types of regrets or may rely on various coping behaviors to different degrees and with different perceived levels of necessity. We examine SNS users' behavior-change goals to better understand the full range of behaviors users may wish to change.

### Persuasive design for behavior change

Persuasive design, and specifically the Fogg Behavior Model (FBM) [8], provides a theoretical basis for examining behavior-change mechanisms. We draw on this model to explore potential avenues for facilitating SNS-behavior change.

In the FBM behavior requires three factors: a person is *motivated*, has the *ability* to perform the behavior, and is *triggered* to carry out the behavior. Motivation can be increased or decreased using pleasure/pain, hope/fear, and social acceptance/rejection. Ability is based on the absence or presence of time, money, physical or mental effort, compliance with social norms, and how routine the behavior is. Behavior-change designs can target these factors, can create or reduce behavior triggers, or can make triggers more or less salient [8].

The type of desired behavior can prompt additional insight. In the Behavior Grid, Fogg categorizes behaviors based on whether the behaviors require increasing, decreasing, stopping, or doing a new or familiar behavior a single time, permanently, or for a specific duration. These categories inform interventions for different types of behaviors. For example, Fogg describes how some behaviors respond to predictable "cycle" triggers, while others require unpredictable "cue" triggers [10].

We use the FBM to examine participant goals. We look at self-reported ability and motivation, as well as facilitators and barriers to achieving goals that roughly correspond to Fogg's motivation- and ability-based axes. We also draw on Fogg's Behavior Grid to examine behaviors involved in steps participants believed they could take to achieve their goals.

Our survey design was also informed by goal-setting theory. Goal-setting theory looks at the impact of goals, goal setting, and feedback on behavior change. Goal setting supports behavior change, although its efficacy is mediated by factors such as the actual and perceived difficulty of the goal and belief in the goal's importance. Work has also found that having more short term, actionable proximal goals combined with more distant, distal goals increases likelihood of success [13].

## METHODS

We performed an online, Amazon Mechanical Turk (MTurk) survey with 604 SNS users. Participants were United States MTurk workers who self-reported having either a Facebook, Instagram, or Twitter account and having logged into it in the last month. Each participant answered questions about one SNS, either Facebook, Instagram, or Twitter ( $n = 383, 85, 136$  respectively). If a participant reported using more than one of the SNSs, one was randomly selected. We

	Facebook			Twitter			Instagram		
	Raw alpha	Mean	Median	Raw alpha	Mean	Median	Raw alpha	Mean	Median
<b>More time/activity</b>	0.75	2.65	2.50	0.82	3.41	3.50	0.84	3.17	3.25
<b>Less time/activity</b>	0.70	2.90	3.00	0.76	2.58	2.33	0.79	2.57	2.25
<b>Presentation of self</b>	0.69	3.06	3.20	0.72	3.35	3.40	0.80	3.13	3.20
<b>Hot/inebriated states</b>	0.74	2.93	3.00	0.72	2.91	3.00	0.76	2.71	2.50
<b>Attention</b>	0.80	3.05	3.00	0.84	3.48	4.00	0.81	3.19	3.33
<b>Privacy Audience</b>	0.65	3.22	3.25						

**Table 1. Average agreement ratings for combined potential-goal scales, by SNS. Full lists of questions contributing to each scale can be found in Appendix Table 4**

removed an additional 29 participants who were not from the US (28) or did not answer the free response questions (1).

The survey format was loosely drawn from goal-setting theory [13]. Participants described “the one thing you would most like to change about your behavior on” the SNS, which was referred to as *their goal*. They provided open-ended responses to explain the goal, why they wanted to change their behavior, benefits of achieving it, as well as anything that currently made it easier or more difficult. They also described three concrete steps they could take toward achieving their goal. These concrete steps were intended to reflect proximal goals from goal-setting theory [13], in contrast to the more distal goal described in the initial free response. Participants also answered Likert scale questions about the difficulty and importance of achieving their goal.

Participants were then asked 23, 25, or 32 Likert scale questions, depending on the SNS. These questions were primarily potential goals that emerged from prior work on SNS regrets and behaviors [29, 23, 22], tailored to each SNS. Participants rated how much they agreed or disagreed with each (full set of Likert items listed in Appendix Table 4). They also answered questions about their SNS use, tailored to the SNS, and about their demographics. Participants were paid \$0.75. The protocol was approved by the Carnegie Mellon University Institutional Review Board.

### Analysis

We coded the free responses about the goals using five sets of codes (the goals themselves, reasons for the goals, benefits of the goals, steps to reach the goals, and facilitators and barriers for the goals). We iteratively developed the codes, beginning by free-coding randomly selected sets of data. For steps, facilitators, and barriers, the codes that emerged after several rounds of iterative coding resembled categories from the FBM. Thus, we then drew heavily from various aspects of the FBM for additional rounds of code development [8, 7, 9].

After codebook development, one researcher coded all the responses. A second coder coded 100 responses from each dataset to verify the codebooks. Kappa values were between 0.74-0.81, except goals/reasons, which was 0.68 (above 0.60 is considered “substantial agreement” [25]).

### DEMOGRAPHICS

604 MTurk workers from the United States completed the survey. 40% of participants self-reported as male, ages ranged from 18 to 73 (average of 33), 73% of participants reported opening and viewing their accounts at least once a day, and 14% were students (12% for Facebook, 25% for Instagram, 13% for Twitter).

Gender did not significantly differ across SNSs (40% male for Facebook, 36% for Instagram, 45% for Twitter). Login frequency was significantly different: 83% of Facebook, 64% of Instagram, and 52% of Twitter participants reported opening and viewing their accounts at least once a day (Kruskal-Wallis test,  $p < 0.001$ ). Average participant age was also significantly different across SNSs (Kruskal-Wallis test,  $p < 0.001$ ). Instagram participants tended to be younger ( $\mu = 28$ ) than Twitter ( $\mu = 33$ ) or Facebook ( $\mu = 34$ ) participants. This may reflect the relatively large and growing use of Instagram among younger users [18].

### RESULTS

Participants wanted to reduce, increase, and improve SNS use to free up more time and improve contact, self presentation, and their own security/privacy. Goals varied by SNS; while participants tended to want to post more on Instagram and Twitter, they tended to want to reduce Facebook use. For Twitter, some goals also varied by participant-use levels. Participants also described a range of perceived steps toward their goals as well as factors that served as barriers and facilitators to achieving their goals.

#### Q1: Types of SNS behavior-change goals

Participant goals show how participants see the SNSs potentially adding to or detracting from their lives. They described the one thing they most wanted to change about their SNS behavior (*their goal*) and rated agreement with supplied goals.

Many participants (169) wanted to use the site less to be more productive. However, participants also wanted to improve how they posted (90) or used the site (72) or to increase how much they used the site (83) or posted (123) for reasons ranging from increasing contact with others to improving how they presented themselves.

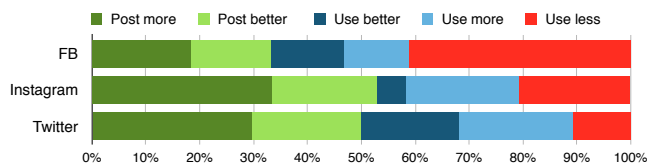


Figure 1. Percentage of participants, by SNS, with each type of goal.

### Free response goals

To examine unprompted goals we asked participants to: “Think about how you typically use [the SNS]. Please describe the one thing you would most like to change about your behavior on [the SNS]” and to explain “why you would like to change your behavior in this way.” We coded each set of responses into one of six goal *types* and one of nine *reasons* for wanting to achieve the goal (Table 2). Participants wanted to: post more, use the SNS more, improve their SNS use, improve their posting, and use the SNS less. We compared frequencies of goals across SNSs using ANOVA tests, with Bonferroni correction for multiple testing.

Of the participants, 540 described goals (Figure 1). We worded our question to encourage participants to volunteer a behavior-change goal based on earlier versions of the survey, in which we found that participants tended to opt out of describing a goal but then agreed with a range of provided goals. However, 27 participants indicated they didn’t want to change any behaviors. We exclude these participants from our analysis. An additional 37 participants described desired changes to the SNS interface, for example an increased Twitter character limit, instead of behavior changes. Although desired interface changes may reflect underlying behavior-change goals, we focused on goals directly related to behaviors and also exclude these participants. Three participants described only desired outcomes (e.g., more followers) but not a method to achieve them. We code these three goals as having reasons, but not types, and include them in our analysis.

### Post more or use more

Many participants’ goals related to posting on the SNS more (*post more*), for example tweeting, commenting, or posting status updates or pictures (123/540, 23%), or increased use of other features, like reading feeds or messaging others (*use more*) (83, 15%). Frequencies of goals related to posting more were significantly different across the three SNSs (18% of Facebook participants’ goals, 33% for Instagram, and 29% for Twitter;  $p = 0.01$ ). Percent frequencies of goals related to using the sites more were not significantly different.

There were several trends in the reasons provided for wanting to post more. Facebook participants tended to want to post more for contact-related reasons (30, 48% of Facebook participants with post-more goals). They described wanting to post more to stay in touch with people they were close with, family, or friends. One participant, for example, wanted to “post more pictures” because “My mom is also on Facebook, and I know she would love to see more pictures of my kids.” This may reflect trends in related work, in which Facebook was used for social support [26].

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**Contact**– want to increase contact with others or strengthen relationships, often with family and friends

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**Time**– prevent lost or wasted time or spend time more productively

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**Intrinsic**– improve a participant’s state, self, feeling, or knowledge, or an internal belief or sense of responsibility related to contributing to the SNS

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**Attention**– increasing likes, followers, or feedback

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**Safety/security/privacy**– increasing the participant’s safety, privacy or security or feelings of privacy or security

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**Self presentation**– improving the participant’s presentation of self, how they believe they are viewed by others, or how they “tell their story”

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**Less bothering**– reducing how much the participant bothers or annoys others

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Table 2. We used eight codes to categorize the reasons why participants wanted to complete their goals. A ninth, “Other,” code is excluded from the table.

Instagram and Twitter respondents, alternatively, frequently wanted to post more for intrinsic reasons (16, 67% of Instagram and 16, 44% of Twitter participants who wanted to post more). These Instagram and Twitter participants tended to believe they should use the sites better, or would generally benefit from more posting or use, for example: “I feel like I am not using Twitter as fully as I can.” Some participants felt a sense of responsibility to increase use or posting: “Others follow me and I don’t write anything” or “I might be missing important information by skipping over certain content.”

### Use less

Participants also wanted to use the SNSs less (169/540, 31% overall). The prevalence of wanting to reduce use varied across SNSs (41% of Facebook, 21% of Instagram, and 10% of Twitter participants;  $p < 0.001$ ). Participants who wanted to use Facebook less tended to want to do so for time-related reasons (104/141, 74%), describing, for example: “I lose too many hours per day while using it.” They also sometimes wanted to reduce use for intrinsic reasons (18/141, 13%), often because Facebook evoked negative emotions. One participant explained that “it usually just ends up pissing me off.”

### Use better or post better

Some participants also wanted to *use the SNS better* (72/540, 13% overall) or *post better content* (90, 17%). Using the SNS better included changing use, for example filtering reading better or trading off use of one feature for another. Posting better included changing how or what they posted, including posting less, different, or better content, or changing their attitude about posting. There were no significant differences across the three SNSs for frequencies of wanting to post better (15% of Facebook, 19% of Instagram, and 20% of Twitter participants) or use the sites better (13% of Facebook, 6% of Instagram, and 18% of Twitter participants).

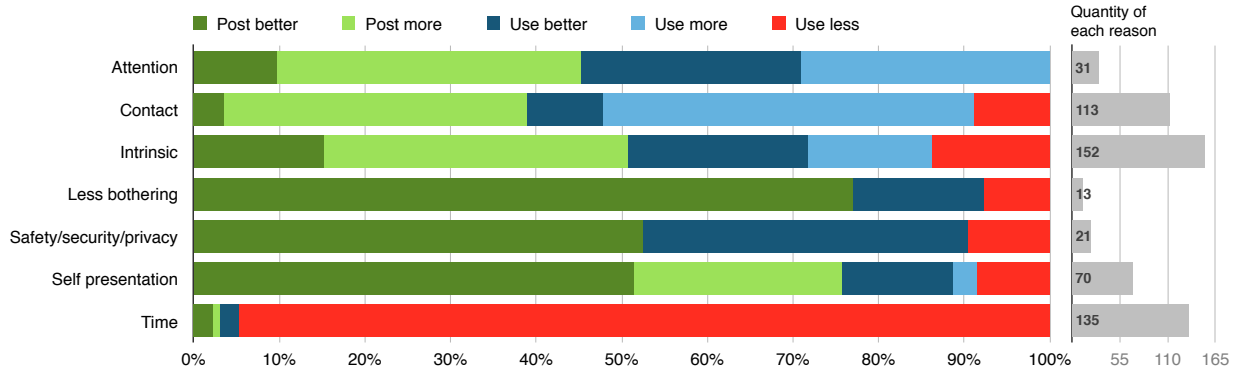


Figure 2. The reasons given, by goal type, for all three SNSs. Codes for goal reasons are defined in Table 2.

Across all three SNSs, participants (21 for Facebook, 5 for Instagram, 10 for Twitter) wanted to post better to improve self-presentation. They wanted to write more interesting or positive posts or self-censor more, for example posting less frequently while drunk or posting less profanity. Notably, some Facebook participants (14 Facebook, 2 Instagram, 3 Twitter) also wanted to improve use or posting for security or privacy reasons, often “Not posting personal info.”

#### Participant-described benefits

Participants also described “any benefits you think you would get by achieving your goal.” Most of the benefit codes corresponded to codes used for the reasons participants gave for their goals (Table 2). Reasons, however, were often behavioral (e.g., a time code that corresponded to “i feel i check it too often”), while benefits were often expected outcomes (e.g., “more time doing other things i like”). Participants (9) also sometimes perceived record creation as a potential benefit. This benefit did not also emerge as a reason, but appears as a perceived SNS benefit in prior work (e.g., Vitak et al. [27]).

For many participants potential benefits corresponded to reasons for goals (292/540, Figure 3). For example, a participant who wanted to improve their use of the site because “I have hurt people’s feelings” felt the main benefit would be “No one angry at me. Knowing I have not hurt anyone.” For other participants, however, potential benefits differed from their reasons (in green in Figure 3). Many participants who wanted to achieve goals for intrinsic reasons, for example, felt that the benefits would be attention- (18 participants), contact- (41), or time- (16) related. Some participants with time-related reasons felt that the benefits would be contact-related (19). These participants tended to feel they could free up time to spend with friends and family, often offline, for example: “Having more free time with family and friends and start to get outside more.”

#### Potential goals from prior work

Free responses about participants’ most important goals provided categories of behavior-change goals and a view of participant perceptions of the three SNSs. However, participants may want to achieve multiple goals to various degrees, and their desires to achieve these different goals may vary based on how they use the SNSs. To broaden our understanding of

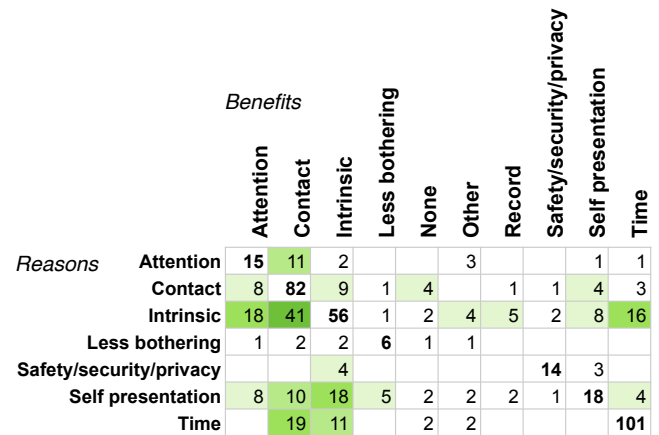


Figure 3. Reasons participants provided for their goals versus the benefits they felt they would attain from the goals. Green boxes indicate areas where reasons and benefits tended to differ. Reasons/benefits codes defined in Table 2.

participant goals, as well as analyze how different uses of the SNSs correlated with different goals, we also asked participants to react to goals drawn from prior work.

Participants rated their agreement with 23-32 goals drawn from prior work and tailored to the SNS. They answered on a five-point scale from “Strongly disagree” (1) to “Strongly agree” (5), with an additional “Not applicable” option. We used the Likert questions to create five (Instagram/Twitter) or six (Facebook) scales based on theory and prior work, with scores averaged for each scale (summarized in Table 1, complete questions by scale are listed in Appendix Table 4). We removed several questions, prior to creating the scales, with agreement rates of less than 15% for the SNS.

People vary in level and type of SNS use. We use logistic regressions with Bonferroni correction for multiple testing to examine associations between levels of SNS use and agreement with the different goals for each SNS. To examine different levels of use we use participants’ self-reported SNS activity to create three levels of SNS interaction: *posting*, if the participant reported posting/tweeting at least weekly, *interaction*, if the participant did not post but reported applicable interactive behaviors (e.g., liking, favoriting, com-

menting, etc.) at least weekly, and *consumption* for the remaining participants. Because social aspects of the SNSs were often important in free responses, we also include use of SNS messaging (Facebook messenger, Twitter direct messaging, and Instagram Direct), as well as age, gender, number of friends/followers/following and use of privacy features. Questions differed by SNS, so we only perform analyses by, rather than across, SNS.

Facebook participants expressed more agreement with goals related to privacy and audience ( $\mu = 3.22$ ), presentation of self ( $\mu = 3.06$ ), and attention ( $\mu = 3.05$ ), relative to other types of goals. For Facebook participants, there were no significant associations between use levels and goal types. However, rarely looking at privacy settings was positively associated with agreeing to goals related to wanting to spend more time on Facebook ( $p = 0.008$ ) and goals related to wanting more attention ( $p = 0.05$ ). Also, participants who used Facebook messaging weekly or more were significantly more likely to want to reduce their time on the site ( $p < 0.005$ ).

Twitter participants also expressed relatively higher agreement with presentation of self-related goals ( $\mu = 3.35$ ) but also tended to agree with goals related to attention ( $\mu = 3.48$ ) and increased time or activity ( $\mu = 3.41$ ). This was consistent with free responses in which they often gave attention or self presentation-related reasons for goals (34) and wanted to increase site use and posting (62). Twitter participants' average agreement for less time/activity-related goals was relatively lower than the other scales ( $\mu = 2.58$ ). In the free responses Twitter participants also infrequently wanted to reduce use of the site (13/129).

Participants who tweeted regularly were less likely to agree with goals related to increasing their Twitter use ( $p = 0.01$ ) than participants who just reported site consumption and, conversely, were significantly more likely to agree to goals related to wanting to reduce site use ( $p < 0.001$ ).

Instagram participants also tended to have lower agreement for the scales related to spending less time on the site ( $\mu = 3.5$ ) relative to the other scales. This was also consistent with the free responses; only 15/79 Instagram participants described wanting to use the site less. There were no significant associations between site use and goal type. However, presentation of self goals were more common for participants who regularly used Instagram's messaging feature (Instagram Direct) ( $p = 0.046$ ). This may reflect a desire for presentation management among these users who send messages directly.

## Q2: Difficulty and importance of goals

According to the FBM and goal-setting theory, goal attainment and strategies for attainment depend on perceived difficulty and importance. We asked participants how much they agreed or disagreed with "Achieving my goal is important to me" and "is difficult" on five-point Likert scales from "Strongly disagree" to "Strongly agree." 54% (294/540) agreed that their goals were important and 32% (173) that their goals were difficult.

In the FBM, behavior can be triggered when a change is considered important and the person has the ability to perform the

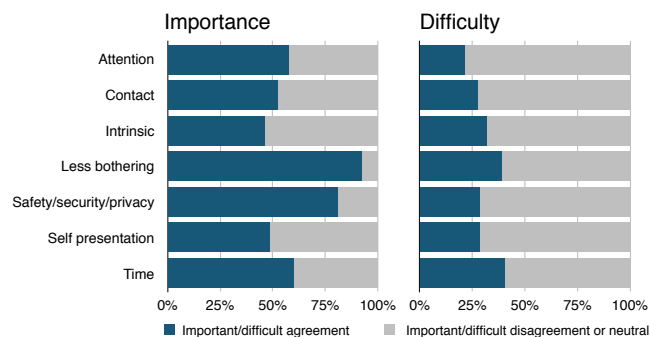


Figure 4. Perceived importance and difficulty by reasons for goals. Reason codes are defined in Table 2.

behavior (low difficulty). Identifying the perceived difficulty and perceived importance of behavior-change goals can guide designers to interventions that facilitate behavior change by enhancing ability (or perceived ability) or enhancing motivation, respectively.

33% of participants (177) considered their goals neither difficult nor important. Many of these goals related to posting more (64). Participants considered 13% (69) difficult but not important, many of which related to reducing use (35). Participants considered 35% of the goals (190) not difficult but important, many of which included using the site less (57) or posting more (41). Finally, 19% (104) of the goals were related as difficult and important, many of which included using the site less (45) or posting better (22). Figure 4 summarizes perceived difficulty and importance by the reasons given for the goals.

## Q3: How could goals could be achieved

Goal attainment requires actionable near-term steps, similar to goal theory's "proximal goals." It also requires drawing on facilitating factors that may already exist as well as overcoming existing barriers. We used Fogg's Behavior Grid to examine opportunities to facilitate the steps participants believed they should take to achieve their goals. We also use ability and motivational factors drawn from the FBM as a starting point to examine factors participants perceived as *facilitators* or *barriers* to their goals.

### Steps to achieve goals

After participants described their goals, we asked for "three specific steps" they could take "in the next month, toward achieving your goal." The question was free response. Some participants listed no steps and others listed less than three, resulting in 1,620 steps for 540 goals. We coded the steps based on Fogg's Behavior Grid for classifying behavior for change [7, 9]. Each was given a *time* interval, either a *one-time* action, a *permanent* or ongoing action, a *permanent cued* action, irregularly cued by events or time intervals (e.g., daily, whenever one logs onto the computer), or a *duration* event that lasted a specific amount of time. We also coded the steps for a type, either a *decrease* or *increase* in an activity or an amount (e.g., deleting friends, posting less or more), *stopping* an activity (e.g., no longer logging onto Facebook), or taking a new or familiar *action*. Figure 5 describes these steps.

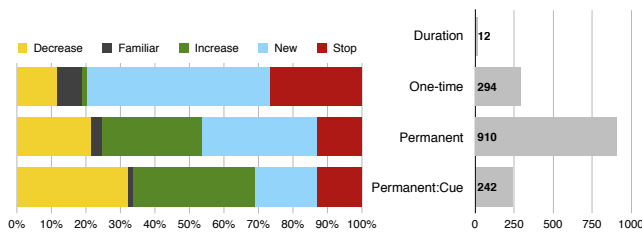


Figure 5. Frequencies of step codes (types and time intervals).

Many steps required making new or familiar actions (334/1,620) permanent. Participants described actions that would last from that point forward and were not direct increases, decreases, or cessations of existing actions. Some participants described self-monitoring strategies they thought they could take. They described adjusting their awareness level or attitude, for example, “*Exercise discipline,*” or “*not take myself too seriously.*” Other prospective steps related to making it easier or harder to perform behaviors participants sought to change, for example, “*Read a book*” as an alternative to using Facebook.

Participants who wanted to improve or increase use suggested steps to proactively create better content or social connections. For example, a participant who wanted to post more varied pictures on Instagram suggested they could “*Take some pictures of scenery.*” For goals related to posting more or using the SNS better or more often, steps to permanently increase an activity or quantity were common (28% of posting more, and 30% of using more, steps). These steps tended to involve increasing use of the SNS in various ways or creating more content to post on the SNS, for example: “*I could take more photos*” or “*Follow more people.*”

For goals like posting better or using the SNS less or better, participants often described permanently decreasing similar activities (19% of steps for post better goals and 21% for use less). These steps tended to involve reducing general activities on the site or specific types of posts. Participants also sometimes described permanently stopping activities (7% of steps), for example, stopping certain behaviors to improve posting like: “*not Drink*” or “*Avoid very personal posts.*”

Participants also suggested permanently increasing or decreasing cued behaviors, similar to Fogg’s “cued” triggers [10]. These tended to be for goals related to using the site more or posting more (13% of use more goal steps and 14% of post more). Cued steps typically involved posting or using the site on a timed (e.g., daily or weekly) basis, for example, “*Post daily on Twitter.*” Many participants wanted to decrease cued actions for goals related to using the SNS less (15% of use less goal steps). These steps often involved limiting use to a specific number of times per day or a specific time period, limit, or schedule.

Alternatively, some steps were one-time actions. To reduce use, this included one-time actions to limit access or use (15% of use less goal steps), such as deleting the SNS application. 10% of steps (155) were one-time new actions, like adjusting

settings, installing an application, learning more about how to use the SNS, or offline actions like “*take a socializing class.*”

### Barriers and facilitators

Participants also described *barriers*, anything they thought “currently makes it difficult to achieve your goal” and *facilitators*, anything they thought “currently makes it easier to achieve your goal.” We coded each barrier into one of eleven categories (Table 3) loosely based on ability and motivation factors from the FBM [8]. Across goal types, except using the SNS less, participants described barriers related to personality or attitude (90, 17% overall), for example, “*My stubbornness*” or “*lack of self-discipline*” as well as traits like “*I’m too blunt*” or “*I am a quiet, shy reserved person by nature.*” Participants also noted lack of time or general busyness as challenges, especially for goals related to increasing posting or use (41 and 33 participants respectively).

Participants also described current habits as a challenge (91, 17% overall) for reducing SNS use (43), but also for posting more (22) or better (13). They described the SNS as an “*addiction*” and how the behavior change was not part of their routine or what they currently do, for example: “*I’m too comfortable in my routine.*”

For some participants (51, 9% overall), especially those who wanted to post better (14) or reduce use (29), challenges arose from pleasure in, or benefits from, behaviors they wanted to change. For example, one participant wanted to reduce use but “*I enjoy messaging my friends on Facebook, and wouldn’t want to give that up.*” Another participant didn’t want to post when drunk but noted “*I really like beer.*” Participants who wanted to use the SNSs less also described access to the site or using it frequently as challenges (29).

Participants also described factors they felt would facilitate goal achievement. We coded each facilitator into one of twelve categories (Table 3) that were again loosely based on persuasive technology work [8]. Many of these categories overlapped the barriers. The same factor can facilitate some goals while serving as a barrier to others (e.g., having free time can help a user post more but could also serve as a barrier to a user who wants to post less).

Many participants described how motivation or awareness of the goal would make it easier to achieve (101, 19% overall). This was common for participants who wanted to reduce use (46). They described, for example, “*will power.*” Technology-related factors were also common, such as SNS features or general ease of use (66), or easy site access or high levels of activity (53), primarily for goals like posting or using the site more. A few participants (17), mostly those who wanted to use the site better or less, mentioned lack of access or activity as facilitators.

Some participants also described social factors that could make their goals easier (47). These included support or help from others, for example, “*Everyone I know uses Twitter, so they can encourage and remind me*” or more generally, “*Having a partner to vent to.*” Participants also sometimes described more general social pressures, like comparing oneself to others, as a facilitating force.

<i>Facilitators and Barriers</i>	<i>Facilitator counts</i>	<i>Barriers counts</i>
<b>Tech</b> – generally related to technology, technical features, technological difficulties, opportunities, or ease	66	17
<b>Tech: have access/activity</b> – having access may make it harder to stop using or easier to use more/differently	53	31
<b>Tech: lack access/activity</b> – lacking access may make it harder to use more/differently or easier to stop	17	6
<b>Time/money</b> – availability of time/money can make it harder or easier to complete goals	29	96
<b>Attitude/personality</b> – a certain attitude or state of being (boredom, laziness, procrastination) makes it difficult or easier to change this behavior, also includes altered states.	35	90
<b>Pleasure/temptation/motivation</b> – enjoying/benefiting from the current behavior makes it hard to change or believing they will enjoy/benefit from the change in behavior is motivational	101	51
<b>Life events</b> – the participant’s current life state (health, employment, etc.) make it easier or more difficult to complete the goal	48	19
<b>Social</b> – social pressure or support makes it easier or more difficult to complete the goal.	47	47
<i>Barriers only:</i>		
<b>Lack motivation</b> – doesn’t want to do it, thinks it’s difficult, doesn’t make it a priority.	–	26
<b>Habit/distraction</b> – distraction prevents participants from making a change, remembering to make a change, or a change is hard to make because it is a habit or addiction.	–	91
<i>Facilitators only:</i>		
<b>Take an action</b> – making their goal easier will come through taking a concrete action, actively changing something.	92	–
<b>Easy/fits in with life</b> – thinking this change will easily fit into the participants life makes it easier.	3	–

**Table 3.** Codes used to categorize factors participants felt either facilitated or were barriers to their goals. Many codes overlapped, because a factor that could facilitate one goal could be a barrier to a different goal (or a different participant). This table excludes an “Other” category.

## LIMITATIONS

We used MTurk to perform our study. While the choice of any recruitment platform introduces some biases, MTurk gave us access to a sample in a time- and cost-effective manner, has relatively known demographics, and is comparable to other online sources [19, 3]. We also used quality-control measures, including upfront open-response questions and filtering for participants who answered nonsensically, as well as requiring participants to meet a quality-control threshold.

We also chose a survey-based approach. We intended to supplement prior work that highlighted aspects of the SNS-behavior-change space (e.g., self-censorship, benefits and uses, etc.) and access a range of participants to provide a breadth of insight. To minimize biasing participants or inducing survey fatigue we limited the length of our survey and were not able to provide the rich, qualitative data that could be drawn from other formats, like interviews or fieldwork. This work is, instead, intended to provide initial insights over a wide range of dimensions, including types of participants, different SNSs, and types of goals.

We also asked participants for self-report data, allowing for a range of biases. Responses are likely biased toward more socially acceptable and recent goals, and may over-represent memorable events. We also purposefully biased participants towards responding with a goal to our free response question, based on pilot testing. This push toward identifying a goal may partially explain why several participants later said they did not think the goals they named were important. Our study results could be confirmed by future work that could

include longitudinal data or observational behavior-tracking. Areas of interest should also be explored through more in-depth qualitative follow-up.

## DISCUSSION

Participants described a range of behavior-change goals. These goals varied by SNS and, for Twitter participants, by site-use level. Facebook participants tended to want to reduce use, while Twitter and Instagram participants wanted to post more or improve their use. Participants envisioned steps they thought they could take to achieve their goals, many of which entailed beginning permanent new or familiar behaviors or repeating cued behaviors. Participants also described factors that could facilitate or serve as barriers to their goal achievement. These factors could inform the design of mechanisms for helping users achieve various desired behavior changes.

### Perceived impact of SNSs

Participants’ behavior-change goals provide a view into how SNS users perceive potential benefits they could achieve from SNSs, as well as perceived potential downsides of SNS use.

Some goals demonstrate how participants feel SNSs could positively impact their lives and changes that might help them receive these benefits more reliably. Participants described wanting to increase site use or use of specific features like posting or messaging to achieve a range of benefits including increased contact, more entertainment, or general better use of the sites.



Other goals focused on reducing potentially detrimental effects of SNSs. Some participants generally wanted to reduce time on the sites because they felt it would help with busyness, lack of productivity, or a desire for more free time. Alternatively, some participants wanted to target specific, potentially harmful behaviors. For example some participants wanted to avoid drunken posting, posting too much personal information, or posting context- or audience-inappropriate content, behaviors that have been found to cause regret or other negative outcomes [23, 29, 14].

Overall goals varied by SNS, demonstrating that participants may associate different potential benefits and negative consequences with different SNSs. For example, Facebook participants tended to want to use the site less (41%), while Instagram and Twitter participants tended to want to use the sites more (21% for each). Facebook participants also tended to want to achieve their goals for contact-related reasons.

More work is needed to explore the basis for these differences in goals across sites, but they may partially reflect differences in the affordances offered by the structures of the three sites. People tend to use Facebook for a range of content and interactions (e.g., messaging, reading, apps, etc.) primarily between “friends” (symmetric relationships). This may lead some people to feel like they waste time on the site because of large quantities of available content, and some people to feel that they should use it more for social connections because of the range of strong and weak tie relationships available. Alternatively, Twitter and Instagram provide a more limited set of content and features. The sites are also more frequently used for non-reciprocated follower/followee relationships than Facebook (e.g., to follow news sources or celebrities, or to act as a ‘celebrity’ and provide content to others). This may lead participants to see these sites as information sources and to aspire to increase consumption.

Twitter participants’ goals also varied with different levels of site use. Compared to participants who only read content, participants who regularly tweeted tended to disagree with goals related to spending more time on the site and, conversely, agree with goals related to spending less time on the site. This may occur because users who already post regularly see the downsides of doing so (e.g., time tradeoffs), while users who do not post regularly only see the potential benefits. More research is needed to probe the factors driving these differences.

### **Design for behavior-change mechanisms**

Beyond using participant behavior-change goals to help understand how people view SNSs, examining these goals, facilitators, and barriers allows us to explore potential mechanisms for helping users achieve desired behavior changes. Based on the range of participant goals, there are several categories of opportunities for behavior-change mechanisms. First, many goals, like reducing use, could be addressed by productivity or time-management-focused behavior-change interventions. Alternatively, other interventions could focus on helping users increase SNS use, for example, prompting use of specific features or trying to help users feel that they are making better use of the site. There is also opportunity

to focus on helping users improve their posts’ content, especially for self-presentation or security/privacy reasons.

### *Persuasive-design levers for SNS-behavior change*

Participants ranged in motivation for, and ability to achieve, their goals. This demonstrates potential avenues for intervention that also are apparent in the short-term steps and perceived facilitators and barriers described by participants.

According to persuasive design, and specifically the Fogg Behavior Model, motivation is necessary for a behavior. Many participants described facilitators or barriers related to a presence or lack of motivation. Participants reported feeling motivation (or not) related to behaviors they wanted to change or achieve. Tools or mechanisms could increase or decrease these factors, for example increasing motivation by making future benefits clearer, or providing reminders of the importance of the change.

Ability to perform a task is also necessary under the FBM. Several facilitators, barriers, and near-term steps, related to ability. Participants pointed out how access to technology, time/money, habit/how well the behavior fit into the their lives, and how easy the technology was to use could facilitate or serve as a barrier to behavior change. This was also reflected in steps in which participants described seeking education or more information. Interventions could also target these areas to try to impact ability. For example, tools could help users make time for an activity through reminders or scheduling. Alternatively, a tool could help a user reduce time for an activity by helping plan alternatives.

In the FBM, a behavior also requires a trigger. Implicit triggers were reflected in many of the steps participants described. Some of these steps were cued by other behaviors or external factors; participants described taking an action every time something occurred or at regular intervals. Interventions could create more explicit triggers. For example, an alarm or reminder could help a user remember to perform an activity like posting content.

Different combinations of these levers could be included in intervention mechanisms to help users achieve different desired behavior changes.

### *Targeted design*

Beyond insights for persuasive design levers, the range of participant goals also has implications for more general SNS-behavior-change design. Prior work focused primarily on generalized interventions; however, overly general interventions may not apply to all users. SNS-behavior-change goals, perceived facilitators and barriers, and perceived benefits vary widely. Interventions, therefore, should be personalized, targeted, or adaptable to a range of goals or needs. In some past work, for example Wang et. al. [28], all participants were provided with the same behavior-change intervention. However, goals (and motivation to achieve goals) vary, and a lever that might facilitate one goal or need (e.g., increased time for users who want to post more) might impede users with different goals or needs (e.g., increased time for users who want to post less). Future interventions should seek to match mechanisms to users’ needs and goals.

### *Social support*

Social factors may also play an important role in SNS-behavior-change design. Many participants described social support or pressure as facilitators or barriers to their goals. In SNS contexts, social connections can be powerful facilitators, especially if supported by, or included in, behavior-change mechanisms. Motivation could be boosted by enlisting others' help or by allowing the user to compare themselves to others in a network. Ability could be increased by helping the user reach out to people in their network who could help them perform relevant tasks. People in a network could also provide reminders or other triggers for behaviors.

However, designers should also be careful about drawing on social factors. For example, comparisons to other people can backfire if participants begin to perceive their current behaviors as typical of, or superior to, others [20]. Alternatively, use of social information may create tensions. It may, for example, remind users that they like the social benefits associated with using a site, even if they would, overall, prefer to decrease use so they can be more productive. Future work should examine the potential for using social factors in SNS-behavior-change interventions.

### *SNS context*

Designers of SNS-behavior-change interventions should also consider the broader SNS context. Most SNSs have business models that rely on holding user attention. While this may be consistent with some behavior-change goals (e.g., posting more, using more), it is at least on the surface counter to others (e.g., using less, aspects of using/posting better that would reduce use). In the longer term, though, it may still be to the advantage of SNS businesses to balance support of use and non-use goals. When users feel that they are acting counter to their interests or identity, or are concerned about sub-optimal behaviors, they can fall back on coping mechanisms that can include site nonuse behaviors, ranging from content deletion, de-friending and self-censorship to account deletion [2, 12, 15, 27, 22, 6]. For longer-term user engagement, it may benefit SNSs to encourage interactions users consider beneficial.

### **CONCLUSION**

Participants recognize a range of potential benefits from SNSs, including increased social contact, better self presentation, and more attention. In some cases they want to change behaviors to take advantage of these benefits. However, they also recognize potential downsides of the sites and sometimes want to use SNSs less or in improved ways to free up time or avoid negative self-presentation or security/privacy risks. These participant goals vary by SNS. For Facebook, participants tend to want to reduce use, while for Instagram and Twitter participants tend to want to increase use. This range of behavior-change goals and perceived benefits shows potential for different types of SNS-behavior-change interventions and, along with provided steps and facilitators/barriers, provides insight into design for SNS-behavior-change mechanisms.

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<i>Facebook</i>	<i>Twitter</i>	<i>Instagram</i>
<b>More time/activity</b>		
...add more friends	...follow more people	...follow more people
...“like” more content	...favorite more tweets	...“like” more photos
...spend more time on Facebook	...spend more time on Twitter	...spend more time on Instagram
...post more	...tweet more	...post more
...spend more time using game apps	—	—
<b>Less time/activity</b>		
...spend less time on Facebook	...spend less time on Twitter	...spend less time on Instagram
...post less	...tweet less	...post less
...spend less time using game apps	—	—
...remove some friends	...unfollow some people	...unfollow some people
...“like” less content	...favorite fewer tweets	...“like” fewer photos
<b>Presentation of self</b>		
...include fewer swear words in my posts	...include fewer swear words in my tweets	...include fewer swear words in my posts
...include more swear words in my posts	...include more swear words in my tweets	...include more swear words in my posts
...post more positive content	...tweet more positive content	...post more positive content
...post more negative content	...tweet more negative content	...post more negative content
...post less of a certain type of content	...tweet less of a certain type of content	...post less of a certain type of content
...post more of a certain type of content	...tweet more of a certain type of content	...post more of a certain type of content
...post more interesting content	...tweet more interesting content	...post more interesting content
...post less interesting content	...tweet less interesting content	...post less interesting content
<b>Hot/inebriated states</b>		
...post less content when I’m drunk	...tweet less content when I’m drunk	...post less content when I’m drunk
...post more content when I’m drunk	...tweet more content when I’m drunk	...post more content when I’m drunk
...post less content when I’m upset	...tweet less content when I’m upset	...post less content when I’m upset
...post more content when I’m upset	...tweet more content when I’m upset	...post more content when I’m upset
<b>Attention</b>		
—	...get more followers	...get more followers
...get more likes for content I post	...get more favorites for my tweets	...get more likes for photos I post
...get fewer likes for content I post	...get fewer favorites for my tweets	...get fewer likes for photos I post
...get more comments for content I post	—	...get more comments for photos I post
...get fewer comments for content I post	—	...get fewer comments for photos I post
<b>Privacy/audience</b>		
...make sure content I post isn’t visible to certain people	—	—
...make sure content I post is visible to certain people	—	—
...make my Facebook privacy settings more restrictive	—	—
...make my Facebook privacy settings less restrictive	—	—
...spend more time checking my Facebook privacy settings	—	—
...spend less time checking my Facebook privacy settings	—	—

Table 4. Potential-goal questions asked to participants as Likert scale questions (five point scale, Strongly Disagree to Strongly Agree). The sets of Likert scale questions were collapsed into the provided scales for analysis. Questions in gray were excluded because of low levels of agreement (< %15).