

Smartphone apps providing social comparison for health behavior change: a need for better tailoring to person and context

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Abstract: Smartphone apps that support health behavior change efforts often provide opportunities for users to compare their behaviors and progress to that of other users (i.e., social comparison). At present, however, available literature on features of these apps has two main limitations: (I) it shows little consistency in its application of the term social comparison, and (II) it does not take into account key aspects and consequences of social comparison that could improve user engagement and behavioral outcomes. In this piece, we provide examples to illustrate the problems in each domain of limitation, and we identify critical aspects of the broader social comparison literature that could inform the tailoring of social comparison features to individual users and contexts.

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Smartphone applications that manage aspects of health (e.g., weight, stress) show promise for increasing the reach of behavior change interventions by delivering them in real time and personalizing to individual users' needs and preferences. Many apps also capitalize on social influence by connecting users to each other, which can activate beneficial processes such as social support and accountability. However, few health behaviors change apps intentionally and systematically engage social processes in ways that are responsive to the needs and preferences of individual users, thereby limiting their efficacy.

A particularly problematic gap between current implementation and optimally engaging social influence concerns social comparison, or self-evaluation relative to others (1). The tendency to appraise ourselves in relation to others is thought to be innate and protective (2); it often happens quickly and implicitly, when we are exposed to relevant information about other people (3). As a result, any smartphone app that offers the opportunity to learn about others' health behaviors could facilitate social comparison. Features such as message boards, direct messages,

behavioral models of behaviors, profiles/feeds for sharing updates, or other features that let users share text or photos with each other could be categorized as social comparison.

Unfortunately, research on app features reflects a lack of clarity regarding which components facilitate social comparison. For example, in physical activity promotion, behavioral models are characterized as "social comparison" by some researchers, but not others. Such inconsistencies limit understanding of which features and which underlying psychosocial processes effectively increase users' physical activity. Also, it is seldom clear how users' information is exchanged; it could be via text (e.g., self-reports on message boards), raw numbers (e.g., total steps taken per day), data visualization (e.g., graphs, leaderboards), photos, videos, or avatars, or combinations of these features. We do not know, however, which of these is most effective for promoting health behavior change. Are they most effective on their own, in combination with each other, or when integrated with other intervention tools? Moreover, do these features actually induce social comparison, or simply make it possible for comparison to be part of a larger set of social

influences? These are some of the critical questions to be answered by researchers and developers as they refine app-based health behavior change interventions.

Additional considerations for optimizing social comparison features

There are several options for tailoring the social comparison experience that have received little attention. First, people differ in their tendencies to make or value comparisons (4), referred to as social comparison orientation (SCO). As noted previously, simply providing information about others (e.g., via message boards) makes social comparison possible; users high in SCO may benefit from a broad range of features that could facilitate comparisons, whereas users low in SCO may require and/or benefit from more direct induction of social comparison (e.g., via leaderboards or instruction). Users who are low in SCO, in fact, may benefit more from other social manipulations (e.g., support, reinforcement), or from non-social features of health behavior change apps.

Comparison dimension

A second option is the specific dimension of comparison—what about the user is being shared, which might be compared to other users? In the physical activity domain, for example, there are a variety of relevant comparison dimensions. These include overall number of steps, minutes of cardiovascular activity, or visits to the gym; overall physical ability (e.g., finishing a distance race) or ability to perform a specific exercise (e.g., challenging yoga poses); physical fitness as judged via appearance (e.g., weight, body shape); or the degree of improvement in any of these areas over time. Which dimension(s) is most relevant or useful for promoting physical activity engagement may vary between users, based on their individual goals. Currently, published reports suggest that developers or researchers have not considered these dimensions, or which of these dimensions is active in particular apps. There also seems to be little recognition that certain individuals may be more preferred or useful as comparison targets on some of these dimensions, but not others; friends may be more relevant and influential for comparisons of progress, whereas expert may be the best targets with respect to physical abilities.

Comparison effects

Perhaps the most important aspect of comparison that

has been overlooked in app development and evaluation is variability in its consequences. Namely, there seems to be an implicit assumption that all opportunities for social comparison are created equal, in that they will all have the desired positive effect on health behavior. Social psychology theory and empirical work show that this is not correct (5-7). Even intentionally activating social comparison will not be effective for some people, such as those extremely low in comparison orientation. But more importantly, comparison can have negative effects (8,9). Anxiety, despondence, and frustration all are fairly common responses to comparison, and only some people are able to channel this negative affect into motivation for behavior change; many simply give up, which could explain some users' disengagement from app use. Further, individual differences in response to social comparison are not the only factor. A person's interest and response may fluctuate over time and context, depending on factors such as mood, stress level, and progress toward behavioral goals.

Next steps for optimizing social comparison features

The field of app design is continually improving its capacity to assess users' dynamic preferences and needs, and respond to these in real time [e.g., just-in-time adaptive intervention (JITAI) designs (10)]. This capacity has not yet been applied to social comparison. Consequently, there is enormous potential to tailor an app's social comparison features to individuals and dynamic contexts, which may provide more engaging and effective health behavior change apps.

To realize this potential, however, it is critical for app developers and researchers to recognize that users may not have optimal insight about how comparison could best support their behavior change efforts. Thus, asking users about what kind of comparative information they would like to access (i.e., preference) is only one step in the process. For example, a user may prefer to access information about others who are less successful in their behavior change efforts (downward comparison), because this information highlights their own superiority and provides some satisfaction. However, this information may do less to motivate this users' continued behavior change efforts than information about others who are more successful (upward comparison), though the user may not be aware of or willing to report it. The user's preference, which is based on an immediate affective response, should be taken into account, and downstream behavioral effects of various comparisons

should also be assessed. Efficacious tailoring might then provide opportunities for both types of comparison that strike a balance between the user's affinity for downward comparison and behavioral response to upward comparison, to promote continued app use and healthy behavior. Furthermore, this balance may differ between users and change within users over time.

Conclusions

Apps that include social comparison as a component will benefit from greater integration of both theory and experimental evidence about social comparison. Although social comparison is a core process for individual and social behavior, it exhibits subtleties that, if recognized, may magnify the benefits of mHealth apps.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

References

1. Festinger L. A theory of social comparison processes. *Hum Relat* 1954;7:117-40.
2. Gilbert P, Price J, Allan S. Social comparison, social attractiveness and evolution: How might they be related? *New Ideas Psychol* 1995;13:149-65.
3. Gilbert DT, Giesler RB, Morris KA. When comparisons arise. *J Pers Soc Psychol* 1995;69:227-36.
4. Gibbons FX, Buunk BP. Individual differences in social comparison: development of a scale of social comparison orientation. *J Pers Soc Psychol* 1999;76:129-42.
5. Arigo D, Cornell M, Smyth JM. Social comparisons in adults with type 2 diabetes: Patients' reasons for target selection. *Psychol Health* 2018;33:906-24. Erratum in: *Corrigendum*. [Psychol Health. 2018].
6. Buunk BP, Ybema JF. Social comparisons and occupational stress: The identification-contrast model. In: Buunk BO, Gibbons FX. editors. *Health, coping, and wellbeing: Perspectives from social comparison theory*. Mahwah, NJ: Erlbaum, 1997;359-88.
7. Gerber JP, Wheeler L, Suls J. A social comparison theory meta-analysis 60+ years on. *Psychol Bull* 2018;144:177-97.
8. Arigo D, Suls JM, Smyth JM. Social comparisons and chronic illness: research synthesis and clinical implications. *Health Psychol Rev* 2014;8:154-214.
9. Holland G, Tiggemann M. A systematic review of the impact of the use of social networking sites on body image and disordered eating outcomes. *Body Image* 2016;17:100-10.
10. Nahum-Shani I, Smith SN, Spring BJ, et al. Just-in-Time Adaptive Interventions (JITAs) in Mobile Health: Key Components and Design Principles for Ongoing Health Behavior Support. *Ann Behav Med* 2018;52:446-62.

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