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Social media and applications to health behavior

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Social media is ingrained in daily life, with high usage and apparent ease of engagement making it an attractive tool for health behavior interventions. Approaches have varied widely in terms of target behavior, social networking platforms used, and intervention characteristics. Targeted applications of Facebook, Twitter, online social communities and apps with social features appear to enhance some aspects of health, and offer unique insights into health-related behavior. However, delivery of an intervention that incorporates an established and popular social media platform does not guarantee impact. Online social media is complex, evolving and nuanced. Future challenges for the field will include evaluating interventions in a diverse populace, and designing features that sustain engagement and behavior change.

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Social media: an opportunity to change health

With nearly 2 billion active users of Facebook, Twitter and other platforms across the world (http://www.statista.com/), social media is an important part of daily life for many people. Used as an umbrella term, 'social media' describes web applications that allow users to generate, share, receive and comment on content via social networks (e.g. Facebook); blogs and microblogs (e.g. WordPress and Twitter); content communities (e.g. YouTube); collaborative projects (e.g. Wikipedia); and virtual gaming (e.g. Second Life) [1].

People's social ties influence a diverse range of health behaviors and outcomes, including cigarette smoking, alcohol consumption, risk of obesity and happiness [2]. The enormous popularity of social media combined with high rates of usage and sustained engagement appear to present an unprecedented opportunity for researchers and clinicians to deliver socially influential online behavior change interventions.

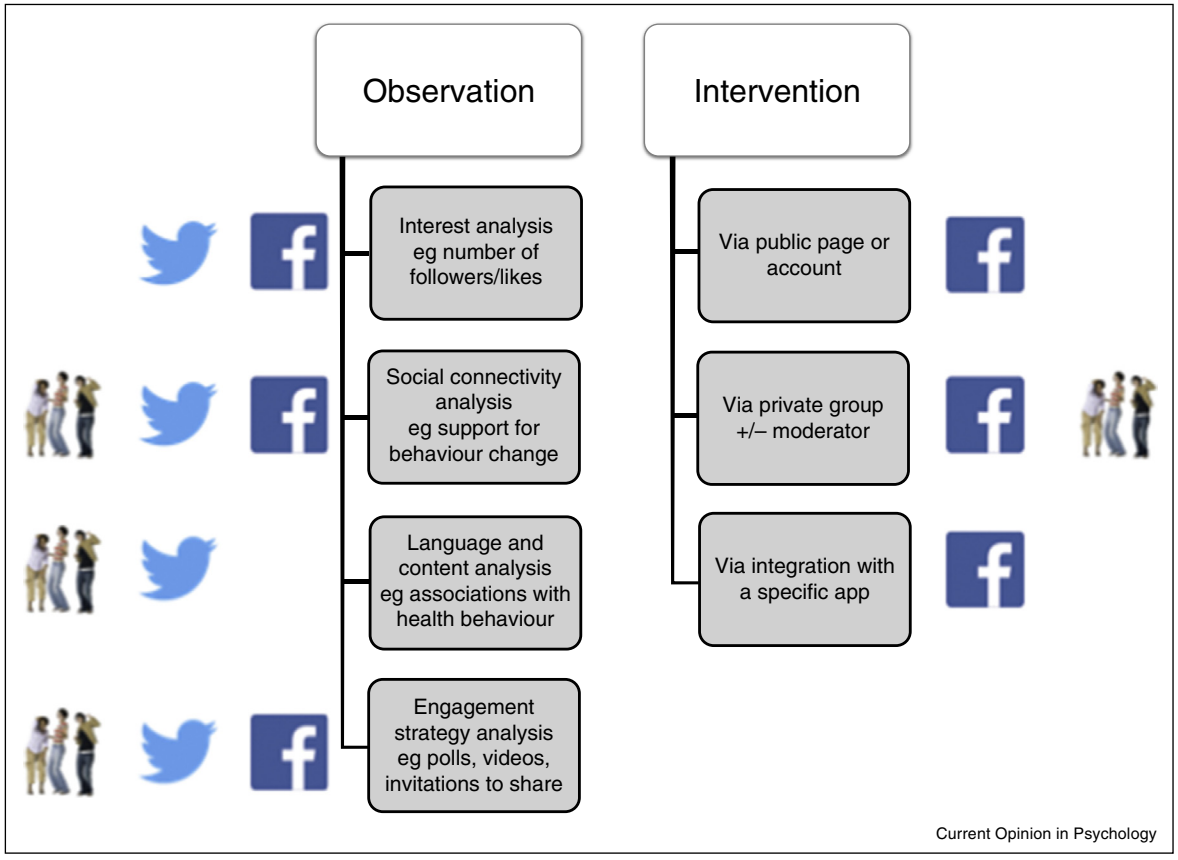
Two early systematic reviews of controlled studies examining health behavior interventions delivered via online social networks appeared in the literature in 2014 [3,4], both concluding there is preliminary evidence that online social network interventions can be used effectively to promote health behavior change. However, research in this field has burgeoned in the past two years. This review sets out to provide a broad overview of the field, with a particular focus on recent developments. It describes the breadth of current applications of online social media in health behavior change research, and highlights areas of promise or warranting further research consideration. Figure 1 summarizes the use of social media for observational studies and interventions for health behavior change.

Facebook: forums, groups and games

Facebook has been the most popular social media platform featuring in health behavior change research. Studies have targeted a wide range of health behaviors, including weight loss [5,6•,7–9], physical activity [10–15], sexual health [16–19], smoking cessation [14], mental health [20], food safety [21], disease self-management [22], and tobacco chewing [23]. Target populations for these interventions have varied. Some studies have covered the general population [16,23], and others targeted specific populations based on: socio-demographic characteristics, for example, African Americans [10,15,18], Latinos [18], women [10], age [9,11,14,19], sexual status [17]; and/or health status, such as overweight/obesity [5,7–9,15], arthritis [22], cancer [11,24], post-partum [5,13] and polycystic ovary syndrome [25].

Commonly, Facebook has been included in multifaceted health interventions. In research contexts, private Facebook groups have typically been used as forums for participants to seek and share advice and social support [5,6•,9–12,14,22], with or without expert moderation. Early attempts using this approach observed low engagement [8,11,12]. However, the particular types of posts associated with greatest engagement have been scrutinized in more recent studies. The most promising approaches appear to be polls [6•,26], provision of photos and/or videos [5,21,23,26], appeals to users to post photos [6•,14], and prompts for participants to share progress [6•].

Figure 1



Using social media to observe and change health. Recently published scientific studies of health behavior change display the use of a range of social media platforms as tools for observation and intervention. To date, the main applications of social media for health behavior change that appear in the literature are Facebook, Twitter and online social communities. Twitter logo used according to http://about.twitter.com/company/brand-assets. Facebook logo used according to http://www.facebookbrand.com/. Online social community image owned by Microsoft Inc.

Some research has started to use open Facebook pages, which intervention participants are encouraged to 'like' to ensure page content appears in their Rich Site Summary (RSS) feed [5,7,16,19,21,23]. Disadvantages of this approach are risk of contamination (for randomized controlled trials) [19] and leaky study privacy [14]. However, the approach seems more congruent with real-world use of Facebook, and engagement rates are promising.

A third mode of Facebook intervention delivery is the use of Facebook apps, which are software applications that integrate with the Facebook platform. Three studies [13,14,27•] each reported Facebook apps designed to increase physical activity in concert with a pedometer, promoting rivalry within existing friendship networks and with gamification features, with promising evidence of efficacy. Li *et al.* [20] reported a Facebook-based animated game aimed at improving university students' stress management.

Twitter: social support and data mining

Although rarely used as a health-change tool on its own, Twitter has been successfully applied as a supplementary aid to increase success of online interventions by enhancing social engagement. Twitter boosted the spread of information and strengthened social networks in an online quit smoking program [28] and enhanced social support for weight loss [29–31] and the '#PlankADay' exercise challenge [32].

In addition, Twitter has been mined as a source of public and searchable data relating to health behavior. For example, auto-tweets generated by users of popular fitness apps such as RunKeeper and Nike+ can provide researchers with information relating to the exercise itself — type, length, day of the week, mood, geographical location and time — and highlight how users share information and engage in social networking regarding fitness activities [33].

Analysis of the language used within health-related tweets has been earmarked as a way to identify populations needing targeted support for exercise and weight loss behaviors [34,35]. Furthermore, analysis of language that increases engagement with Twitter accounts