



## Review

## Scales for measuring user engagement with social network sites: A systematic review of psychometric properties



Leif Sigerson, Cecilia Cheng\*

Department of Psychology, The University of Hong Kong, Pokfulam Road, Hong Kong

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## ABSTRACT

In the past decade, various scales have been developed for measuring engagement with social network sites (SNS), but validity concerns have recently been raised about some of them. The present study thus provides a systematic review of the psychometric properties of these scales. This review included articles that aimed at either developing an SNS engagement scale or providing a systematic test of the psychometric properties of the scale. We conducted keyword-based searches of several broad multidisciplinary databases, along with reference list searches and article citation searches. These search strategies yielded a total of 14 reports, revealing validation evidence for 12 SNS engagement scales among 13,861 participants from 11 countries. There was mixed evidence for the various types of validity tests, with some scales having been validated more rigorously with multiple studies and samples while others having not yet been systematically validated. Sampling and acquiescence biases were also present for some scales. The present review provides recommendations for researchers intending to study SNS engagement. Although the literature search was multi-faceted, it may conceivably have missed studies that provided less rigorous validity evidence. Overall, this study contributes to evaluating and strengthening the methodological foundations of SNS research.

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\* Corresponding author.

E-mail address: [ceci-cheng@hku.hk](mailto:ceci-cheng@hku.hk) (C. Cheng).

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## 1. Introduction

### 1.1. Social network sites

The rise of the Internet has spurred interest across multiple social sciences disciplines in how this new technology can transform social dynamics (e.g., Kraut et al., 2002; Wellman, 2002). The subsequent prevalence of social network sites (SNS) since the mid 2000's has only increased this academic interest. Boyd and Ellison (2007, see also Ellison & Boyd, 2013), define an SNS as "a networked communication platform in which participants 1) have uniquely identifiable profiles that consist of user-supplied content, content provided by other users, and/or system-provided data; 2) can publicly articulate connections that can be viewed and traversed by others; and 3) can consume, produce, and/or interact with streams of user-generated content provided by their connections on the site." (Ellison & Boyd, 2013, p. 158). Although Facebook is the most widely-known SNS with the greatest number of users worldwide, many others, such as Twitter and LinkedIn, are also popular (Dreamgrow.com, 2017).

### 1.2. Measuring SNS engagement

Though SNS are becoming an integral part of many people's daily lives (Pew Research Center, 2011; Statista, 2018), multiple studies have shown that there are important individual differences in how SNS are used (C. Y. Lai & Yang, 2014; N. Park, Lee, & Kim, 2012). To capture these differences, researchers have used a variety of measurement techniques. Some techniques focus on objective behaviors (e.g., time spent on SNS, frequency of SNS behaviors), and data mining-based methods provide promising new opportunities to collect this type of data (Burke & Kraut, 2013; February). These methods may be particularly useful in situations where self-report methods are likely to be inaccurate, such as in estimating amount of time spent on Facebook or the Internet (Junco, 2013;

Scharkow, 2016).

These techniques, however, may be less adequate in measuring the psychological aspects of SNS use, such as emotional connection to the SNS (Jenkins-Guarnieri, Wright, & Johnson, 2013; Orosz, Tóth-Király, & Bóthe, 2016) or the motivations underlying SNS behaviors (Lomborg & Bechmann, 2014; Mahrt & Scharkow, 2013). Thus, misinterpretations of SNS use and behavior are more likely for studies that rely solely on objective measures (Ellison & Boyd, 2013). For example, an objective behavior such as re-posting someone else's status can indicate an affirmation of their relationship, or simply a superficial passing along of information (Boyd, Golder, & Lotan, 2010).

To capture psychological aspects of SNS use, several scales have been developed that assess the level of an individual's engagement with the SNS. Engagement refers to "a quality of user experience with technology that is characterized by challenge, aesthetic and sensory appeal, feedback, novelty, interactivity, perceived control and time, awareness, motivation, interest, and affect" (O'Brien & Toms, 2008, p. 23).

SNS engagement has been linked to a variety of important psychosocial outcomes, such as social capital (e.g., Steinfield, Ellison, & Lampe, 2008), self-esteem (e.g., Faraon & Kaipainen, 2014), and well-being (Ybarra, Résibois, Jonides, & Kross, 2017). McCay-Peet and Quan-Haase (2016) provide a comprehensive working definition of SNS engagement, stating that it is an umbrella construct that encompasses six major facets. These are (a) self-presentation, or the creation of a virtual identity on the SNS; (b) action and participation, comprising the different behaviors that can be performed on an SNS (e.g., retweeting, liking, friending); (c) uses and gratifications, which cover the user's motivations for using the SNS, such as for social or informational purposes; (d) positive experiences on the SNS, which help maintain the user's engagement; (e) usage and activity counts, which can represent either overall usage (e.g., time spent on the site), or data presented to the user about their behavior or the behavior of their SNS contacts (e.g.,

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