



## Full Length Article

The Big Five personality traits, Big Two metatraits and social media: A meta-analysis<sup>☆</sup>Dong Liu<sup>a,\*,1</sup>, W. Keith Campbell<sup>b,\*,1</sup><sup>a</sup> Department of Psychology, Renmin University of China, China<sup>b</sup> University of Georgia, United States

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## ABSTRACT

This article reported a meta-analysis of the relationships between social network site use and the Big Five (neuroticism, extraversion, openness, agreeableness, and conscientiousness) as well as the Big Two (plasticity and stability) personality meta-traits. A random effect meta-analysis model was used to calculate the meta-results of Big Five. Extraversion and openness were the strongest predictor of SNS activities (e.g. gaming, SNS interaction, etc.), while conscientiousness, neuroticism, and agreeableness only correlated with a few of the SNS activities. A meta-analytical structural equation model further demonstrated that plasticity was positively correlated with SNS activities, whereas stability was a negative predictor. Practical implications for social media industry and users were discussed.

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## 1. Introduction

The practice of checking profiles and posting updates on one or more social network site (SNS) has become part of everyday life for many individuals. On SNS, people can broadcast large amount of personal information (which can be in many forms such as text, images, links, or video; Liu & Brown, 2014) and social request to broad audiences. They can also comment directly on the posts friends placed on Facebook or reply in through other online channels (e.g., Twitter, Snapchat) alternate channels offline (e.g., phone calls, text messages or face to face). But what drives these SNS behaviors? Examining the role of personality traits in predicting SNS activity is one potential useful way to understand the psychology of SNS use. As such, a burgeoning literature has emerged examining personality and SNS activity. One major focus has been on examining the Big Five or Five Factor model (FFM) of personality traits and SNS activity, with the specific traits being neuroticism, extraversion, openness to experience, agreeableness, and

conscientiousness. Importantly, Facebook is the world's largest SNS platform. It is also the most studied by a wide margin (Rains & Brunner, 2015). Therefore, our meta-analysis will focus primarily on Facebook.

Although considerable evidence (reviewed below) suggests that certain Big Five personality traits are associated with certain aspects of SNS use, several issues connecting personality traits and SNS use remain ambiguous. First, after one decade of investigating the relationships between FFM traits and SNS use, there are no conclusive estimates regarding the extent to which specific personality traits are linked to SNS activities except for text communication (Golbeck, Robles, & Turner, 2011; Kosinski, Stillwell, & Graepel, 2013). Second, and related, prior studies remain limited either in the sample size or in the scope of social networking online (e.g., focusing solely on global SNS usage or a single SNS). There is not an integrated picture of how personality is linked the digital footprint people leave on SNS, not only in terms of time spent on SNS, but also in terms of particular online activities. Third, while there has been a focus on the Big Five traits at the trait level, there has been no research on the link between SNS use and the two higher order factors of the Big Five, or Big Two (e.g., DeYoung, 2006; Digman, 1997). Theoretically, an opportunity exists to pair a Big Two model of personality with a cybernetic approach in order to provide a plausible higher-level account of personality and SNS use (DeYoung, 2015). Given these questions, the time is ripe for a systematic review and analysis of the online social networking literature. This review has three goals:

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1. Evaluate the link between SNS use and personality.
2. Do so using two personality models, the Big Five trait model and the Big Two metatraits model.
3. Examine the possibility of publication bias in these research areas.

We address these goals with a series of meta-analyses but first provide a more detailed discussion of the theory and recent findings on personality and social networking online.

## 2. Social network site activities

Before articulating our theoretical basis, it is useful to review the main SNS activities reported in the literature. Among the studies we collected, most have used a single measure of SNS use, such as duration time or use intensity in the study, as a correlate of personality traits. These data are interesting but limited in that they do not distinguish between specific SNS activities participants engage in while using SNSs. To gather more specific data on SNS use, we also examined the relation between personality traits and the following specific SNS activities: status updates, interactions, number of photos, information seeking, SNS gaming, and number of SNS friends. Here, *status updates* refer to verbal self-presentation about oneself. *Interactions* refer to responses specifically to other people's disclosures, photos or comments. The simplest interaction is to click the "like" response. SNS also enables people to post photos, which may be of themselves ("selfies") or of personally meaningful or interesting scenes. The number of photos on SNSs is thus accountable. SNS gaming involved playing various games with online SNSs friends. Facebook enables users to form ostensible or virtual social bonds by mutually declaring each other to be "*friends*." Although a large proportion of SNS friends come from offline, many of them are only slight acquaintances, in some cases having met once or even not at all. Each person's tally of such friends is kept by the SNS, thereby enabling researchers to explore the size of these friendship networks. Information seeking refers to browsing information about online friends, or browsing through a pool of information that involved more than one person or one type of information (e.g., the newsfeed page, all events page, all friends page, etc.).

## 3. The Big Five traits and social network sites use

The Big Five is the most widely used and well-validated taxonomy of personality traits, using five dimensions to describe personality: neuroticism, extraversion, openness to experience/intellect agreeableness, and conscientiousness (for a recent review, see John, Naumann, & Soto, 2008). These Big Five traits can capture a very large amount of variance in personality, hence the moniker of "Big".

High scores on Neuroticism are associated with anxiety, depressive affect, and emotional instability (Costa & McCrae, 1992). In cybernetic or motivational terms, neuroticism is a "defensive response" to threat (DeYoung, 2015). It is plausible that in many cases SNS behavior can be used to mitigate neuroticism by providing an outlet for conversation or social connection. Supporting this hypothesis, research has shown that neurotic individuals are more likely to blog (Guadagno, Okdie, & Eno, 2008) and post on their walls (Ross et al., 2009; Moore & McElroy, 2012).

Extraversion is associated with activity, social gregariousness, optimism, drive, and talkativeness (e.g., Costa & McCrae, 1992). Extraversion is linked to excitement-seeking (Eysenck & Eysenck, 1975) and seeking social attention (Ashton, Lee, & Paunonen, 2002). In cybernetic terms, as noted, extraversion is associated with reward seeking and behavioral exploration. It is

likely that extraverts will engage in higher amounts of social activity on SNS because they are reward seeking and sociable. Prior studies on SNS have consistently found that extroverts not only spend more time on SNS (Wilson, Fornasier, & White, 2010), had more Facebook friends (Ong et al., 2010; Ross et al., 2009), and also are central in many social networks (Feiler & Kleinbaum, 2015).

Openness to experience includes the tendency and ability to seek, detect, comprehend, and utilize patterns abstract and sensory of information. High openness is also associated with an interest in art and fantasy (Costa & McCrae, 1992). High openness to experience is reflected in curiosity and novelty-seeking; low levels are evident in preferences for adhering to convention and established patterns (John & Srivastava, 1999). In cybernetic terms, openness is associated with exploration and curiosity (DeYoung, 2015). These psychological states seem to be closely related to new media use. It is expected that those who score high in openness are more likely to try all SNS activities. In previous studies, openness has emerged as a reliable predictor of SNS use (Moore & McElroy, 2012).

Agreeableness reflects one's interpersonal orientation towards others, including sympathy, courteousness, interpersonal flexibility, kindness, trust and forgiveness (Costa & McCrae, 1992). In cybernetic terms, agreeableness is associated with cooperation and relating positively to others (DeYoung, 2015). Individuals who score low on agreeableness are likely to have significant difficulty in forming offline friendships and turn to SNSs for help (Ross, Orr, Sisc, Arseneault, Simmering, & Orr, 2009).

Conscientiousness can be described as the tendency to follow the rules, be industrious and dutiful, and resist immediate gratification in the interest of longer term goals. Indeed, from a cybernetic perspective, conscientiousness is primarily about protecting long term goals from short term temptations (DeYoung, 2015). When framed in this way, it is reasonable that conscientiousness would be associated with lower levels of SNS – assuming that SNS is often tempting distractions that interfere with longer term goal. This has been found in the research: individuals scoring high on conscientiousness were more likely to spend less time on SNS while completing other tasks (e.g., Carrier, Cheever, Rosen, Benitez, & Chang, 2009). Similarly, Moore and McElroy (2012) found that conscientiousness was associated with greater regret over inappropriate Facebook posts, suggesting that conscientious individuals present themselves cautiously online. Overall, the suggestion is that conscientiousness is negatively associated with SNS use.

## 4. The Big Two metatraits and social network sites use

The Big Five traits can be captured at a higher order by metatraits. Our focus is on the Big Two metatraits (DeYoung, 2006, 2015; Digman, 1997). These Big Two have several names and associated conceptualizations. One is the metatrait more closely associated with extraversion, dominance and openness, termed plasticity (DeYoung, 2015), beta (Digman, 1997), agency (Bakan, 1966), status (Wiggins, 1979), and dominant (Leary, 1957). The other is the metatrait more closely associated with agreeableness, conscientiousness and peace/low anxiety, termed stability (DeYoung, 2015), alpha (Digman, 1997), communion (Bakan, 1966), and love (Leary, 1957; Wiggins, 1979).

These models of the Big Two vary in specificity, so scales such as those developed by Wiggins primarily capture extraversion and agreeableness (McCrae & Costa, 1989) whereas the explicit efforts to capture metatraits such as those by DeYoung and Digman capture more of the Big Five, with plasticity/beta primarily extraversion and openness and stability/alpha primary agreeableness, (low) neuroticism and conscientiousness.

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