Exploring the Impact of Optimum Stimulation Level on Individual Perceptions of IT Innovations: A Trait Hierarchical Model Perspective

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Abstract
Given that IT innovations and their components as well as their characteristics can all be viewed as a stimulus, optimum stimulation level (OSL), a general personality trait that characterizes individuals’ general need for stimulation, is a pertinent and important theoretical construct to information systems (IS) research. Despite its significance, OSL has remained seldom studied in the IS discipline. Its impact on individuals’ responses in the interaction with IT innovations continues to be largely underexplored. Drawing on OSL theory, this study theorizes the positive effect of OSL on individuals’ perceived ease of use (PEOU) and perceived usefulness (PU) of IT innovations. Leveraging the trait hierarchical model and building upon the literature on technology acceptance model (TAM), personal innovativeness in information technology (PIIT), computer self-efficacy (CSE), and OSL theory, this study further theorizes the mediating effects of IT domain-specific traits, namely, PIIT and CSE, on the effect of OSL on PEOU and PU. Analysis of survey data on 383 social networking site users validates the theorized relationships. This study contributes to IS research on personality traits and adds to the trait hierarchical model by theorizing and empirically validating the nomological network of OSL with PIIT and CSE. Moreover, it contributes to the literature on IT adoption and use by linking OSL to TAM constructs. It also advances OSL research by uncovering the influence mechanisms of OSL on PEOU and PU. Furthermore, this study provides a holistic understanding of the relationships among PIIT, CSE, and PEOU.

Keywords: Optimum Stimulation Level Theory; Trait Hierarchical Model; Technology Acceptance Model; Social Networking Site; Personal Innovativeness in Information Technology; Computer Self-Efficacy.

Introduction
Understanding individual acceptance and use of IT innovations is an important research subject in information systems (IS) research (Hess, McNab, & Basoglu, 2014; Moore & Benbasat, 1991; Venkatesh, Morris, Davis, & Davis, 2003; Venkatesh, Thong, & Xu, 2012) because such acceptance and use act as the initial step toward the business value realization of IT innovations. Several significant theoretical models, including theory of reasoned action (TRA) (Fishbein & Ajzen, 1975), theory of planned behavior (TPB) (Ajzen, 1991), technology acceptance model (TAM) (Davis, 1989), and innovation diffusion theory (IDT) (Rogers, 1983), explain individual acceptance and use. Although these theories have distinct theorizations about the factors driving individual acceptance decisions, they converge on the idea that individual...
For instance, Agarwal and Prasad (1999) investigated understanding of the antecedents of PEOU and PU. A number of researchers have responded to this call (Lewis et al., 2003). Indeed, some researchers (e.g., Venkatesh, 2000) focused on the determinants of PEOU from the anchoring and adjustment perspective. He found that aside from perceived external control and resource-facilitating conditions, individual traits such as computer self-efficacy and computer anxiety have significant effects on PEOU. While these studies shed light on our understanding of a small and limited set of antecedents, Lewis et al. (2003) proposed a systematic and comprehensive framework positing that PEOU and PU are developed within a milieu of three sources of influences, namely, individual, social, and institutional factors. Of the three sets, individual characteristics, such as personality traits, have the most proximate influence on individual perceptions (Lewis et al., 2003). Indeed, some researchers (e.g., Devaraj, Easley, & Crant, 2008) have demonstrated that personality traits (e.g., the five-factor personalities) play a significant role in affecting PEOU and PU.

Despite their critical importance, personality traits have, thus far, received scarce attention in the IS field, and much research is required to achieve a richer understanding of the effects of personality factors (Barnett, Pearson, Pearson, & Kellermanns, 2015; Devaraj et al., 2008; McElroy, Hendrickson, Townsend, & DeMarie, 2007). From a practical perspective, identifying a stable individual characteristic that has a persistent influence on individual adoption decisions across multiple technologies is of substantial value for companies’ implementation and marketing of IT innovations (Devaraj et al., 2008; McElroy et al., 2007; Yi, Fiedler, & Park, 2006). Against these theoretical and practical backgrounds, the present study investigated one personality trait previously unexplored as an antecedent of PEOU and PU, the optimum stimulation level (OSL). The reasons for examining OSL are elaborated as follows.

Optimum stimulation level is a core concept in OSL theory. It is a general personality trait that measures the individual’s preferred level of stimulation perceived as the most satisfying and pleasant (Mowen, 2000; Raju, 1980; Steenkamp, 2010). Psychological research affirms that individuals with dissimilar OSLs exhibit divergent levels of sensitivity to the same stimulus. In general, high-OSL individuals have a stronger tendency to explore. They are more likely to form positive perceptions of unfamiliar and novel stimuli compared with low-OSL individuals. Given that many consumer behaviors (e.g., adopting new products, services, and brands) possess an exploratory component, OSL has drawn much attention from marketing and consumer behavior researchers (Baumgartner & Steenkamp, 1996; Steenkamp, 2010; Steenkamp & Baumgartner, 1992; Steenkamp & Burgess, 2002). Numerous studies revealed that, unlike other general personality traits, OSL has considerable explanatory power for consumer behaviors, especially for those with an exploratory component (Joachimsthaler & Lastovicka, 1984; Steenkamp, 2010; Steenkamp & Baumgartner, 1992).

Although OSL has been extensively studied in the marketing literature (Steenkamp, 2010), it has yet to be investigated by IS researchers to ascertain OSL’s effects on individual perceptions of IT innovations. In essence, individual acceptance and use of IT innovations is a process wherein individuals explore and learn about IT innovations to form perceptions and make adoption decisions. Similar to various consumer behaviors encountered in traditional marketplaces, individual acceptance and use of IT innovations also possess exploratory elements. Furthermore, according to the stimulus–organism–response (S–O–R) paradigm, IT innovations (e.g., social networking sites), their components (e.g., website interactivity features (Jiang, Chan, Tan, & Chua, 2010)), and their characteristics (e.g., website visual appeal (Parboteeah, Valacich, & Wells, 2009)) can all be viewed as a stimulus. Therefore, as a general personality trait characterizing individuals’ general need for stimulation, OSL shapes individual perception, attitude, and behavior toward IT innovations. In this study, we propose that OSL significantly and positively
affects individual perceptions of ease of use and usefulness of IT innovations. Therefore, this study aims (1) to theorize the influence of OSL on PEOU and PU and (2) to investigate the mediator role of IT domain-specific traits, namely, personal innovativeness in information technology (PIIT) and computer self-efficacy (CSE), underlying such influence.

The remainder of this paper is organized as follows. The next section explicates the OSL theory, reviews the relevant literature, and elucidates the trait hierarchical model. After presenting the research model and hypotheses, we describe the research method and report the data analysis results. Then we discuss the research findings and implications and present limitations and future research directions. Finally, we conclude this paper.

Theoretical Foundation

Optimum Stimulation Level Theory

OSL theory is a psychological theory that posits that all individuals desire to keep their obtained stimulation at the most pleasant level (the OSL), and any departures from OSL lead individuals to make attempts to adjust the stimulation (Hebb, 1955; Leuba, 1955; Raju, 1980; Steenkamp & Baumgartner, 1992; Zuckerman, 1979). When the obtained stimulation is below OSL, individuals will feel bored and will desire to increase the stimulation. Consequently, individuals will engage in exploratory behaviors, such as exploring and novelty seeking, which heighten the stimulation level. Conversely, when the obtained stimulation is above OSL, individuals will take actions, such as simplifying stimulus inputs and avoiding stimulation sources, to reduce the stimulation (Menon & Kahn, 1995).

OSL theory also proposes that all stimulus situations have four attributes in varying degrees: novelty, uncertainty, complexity, and conflict. Combined with the perceived reward or punishment associated with the stimulus, these attributes determine the stimulation level of the stimulus (Berlyne, 1960; Wahlers & Etzel, 1985). To illustrate, consider the situation in which an individual downloads a new song from the Internet that he/she has never heard before. As the song is new, the novelty level of the song is high for the individual. Whether the song fits well with the individual’s personal taste and preference is uncertain until the individual finishes listening to the song. For the individual, the song may be complex in terms of its background music (e.g., diverse melodic turns) and lyrics (e.g., various elements). Conflict associated with listening to the song is not very salient. Thus, the level of conflict is minimal or even negligible. In the situation described above, suppose that the individual likes the song and the individual perceives pleasure from listening to it, the stimulation level of the song is high for the individual because of a high level of perceived novelty, uncertainty, complexity, and reward (pleasure, in this case) associated with listening to it.

Moreover, according to OSL theory, the stimulation level of a stimulus is not static to an individual; rather, it is contingent upon the stimulus situation. Repeated exposure reduces the stimulation level of a stimulus because the novelty, uncertainty, and complexity associated with the stimulus decrease with exposure repetition (Berlyne, 1960). Again, take listening to a song as an example. The stimulation level of a song is high the first time an individual listens to it. As the individual listens to the song repeatedly (such as for 50 times in a continuous period), the stimulation level of the song for the individual will decrease because the individual’s perceived novelty, uncertainty, and complexity associated with the song will also decrease.

Central to OSL theory is the concept of OSL, a broad and general personality trait that characterizes individuals’ general need for stimulation. Hebb (1955) and Leuba (1955) suggested the existence of individuals’ OSL. Subsequent scholars conceptualized OSL as a personality trait (e.g., Fiske & Maddi, 1961; Joachimsthaler & Lastovicka, 1984; Lepp & Gibson, 2008; Maslowsky, Buvinger, Keating, Steinberg, & Cauffman, 2011; Mittelstaedt, Grossbart, Curtis, & DeVere, 1976; Park & Jang, 2014; Sharma, Sivakumar, & Marshall, 2010; Steenkamp & Burgess, 2002; Steenkamp, ter Hofstede, & Wedel, 1999) and developed questionnaire scales to measure this trait (e.g., Garlington & Shimota, 1964; Mehrabian, 1978; Mehrabian & Russell, 1973; Pearson, 1970; Steenkamp & Baumgartner, 1995; Zuckerman, 1979; Zuckerman, Kolin, Price, & Zoob, 1964). A number of scholars, including Mehrabian and Russell (1973), Zuckerman (1979), Steenkamp and Baumgartner (1992, 1995), and Steenkamp (2010), explicitly noted OSL as a broad and general personality trait, while Mowen (2000) offered both theoretical and empirical support for such a notion. As a broad and general personality trait, OSL is stable in a certain individual but varies among individuals (Raju, 1980; Steenkamp, 2010; Steenkamp & Baumgartner, 1992; Steenkamp & Burgess, 2002). A higher OSL indicates a stronger need for stimulation. OSL theory suggests that individuals with dissimilar OSLs exhibit different responses to the same stimulus. Individuals with low OSL tend to stick to the status quo and feel comfortable with familiar stimuli and situations. In contrast, individuals with high OSL are likely to feel bored in stable and familiar environments. They have a pronounced tendency to explore new stimuli and situations to satisfy a strong need for stimulation (Kish & Donnenwerth, 1972; Raju, 1980). Moreover, high-
OSL individuals place great importance on the values of stimulation and openness to change (Steenkamp & Burgess, 2002). They are open to new experiences and are bold and active in trying new and unfamiliar things (Aluja, Garcia, & Garcia, 2003; Vries, Vries, & Feij, 2009).

Given that anything in the environment can be a stimulus to individuals, OSL theory has been applied in multiple fields (e.g., marketing, advertising, tourism, medicine, and IS) to explain a wide variety of individual responses (e.g., cognition, affect, attitude, and behavior). For instance, OSL theory has been employed extensively by marketing and consumer behavior researchers to investigate the influence of OSL on individuals' purchase and adoption of new and innovative products and services. Furthermore, OSL theory has been adopted to explain individuals' perception and attitude toward advertisements (e.g., Galloway, 2009; McDaniel, Lim, & Mahan III, 2007), choice of tourism destinations (e.g., Lepp & Gibson, 2008; Niininen, Szivas, & Riley, 2004), engagement in violent video games (e.g., Jensen, Weaver, Ivic, & Imboden, 2011), risk driving (e.g., Scott-Parker, Watson, King, & Hyde, 2012), and drug use (e.g., Leeman, Hoff, Krishnan-Sarin, Patock-Peckham, & Potenza, 2014), among others. In the present study, we mainly report findings in the marketing, consumer behavior, and IS fields because of their relevance to our exploration of the influence of OSL on individual perceptions regarding IT innovation use.

OSL is a key factor underlying consumer exploratory behavior. High-OSL consumers have greater propensity to engage in exploratory behavior compared with low-OSL consumers (Raju, 1980; Steenkamp & Baumgartner, 1995). High-OSL consumers are considerably more interested in learning about and trying new and unfamiliar products, services, and brands which have the potential to invoke curiosity and new experiences (Raju, 1980; Steenkamp & Baumgartner, 1995; Steenkamp & Burgess, 2002). Such consumers are more willing to take the risks and challenges encountered during their learning and trying processes than their counterparts (Raju, 1980; Steenkamp & Baumgartner, 1995). They also seek much more information when the information search is curiosity-motivated (Steenkamp & Baumgartner, 1992).

In addition, OSL is an important trait variable that explains consumer innovativeness in the adoption of new and innovative products and services (Grossbart, Mittelstaedt, & DeVere, 1976; Joachimsthaler & Lastovicka, 1984; Mittelstaedt et al., 1976; Raju, 1980; Steenkamp & Baumgartner, 1995; Steenkamp & Burgess, 2002). With regard to such products and services, studies suggested that high-OSL consumers have more favorable attitudes toward, have greater willingness to try, and are more likely to adopt them compared with low-OSL consumers (Fiore, Lee, & Kunz, 2004; Grossbart et al., 1976; Helm & Landschulze, 2009; Mittelstaedt et al., 1976; Steenkamp & Baumgartner, 1995). Moreover, high-OSL consumers proceed from awareness to trial of new products and services faster (Grossbart et al., 1976; Mittelstaedt et al., 1976).

OSL also relates closely with consumer variety-seeking tendency and behavior. High-OSL consumers exhibit a greater inclination (Sharma et al., 2010) and a higher level of variety seeking in product choices (Menon & Kahn, 1995; Steenkamp & Baumgartner, 1992, 1995). They not only try but also concurrently use a larger number of brands than low-OSL consumers do (Steenkamp & Burgess, 2002). Moreover, high-OSL consumers are predisposed to alternate among multiple brands of the same product or service category rather than remaining with a particular brand (McAlister & Pessemier, 1982; Menon & Kahn, 1995).

Prior marketing and consumer behavior studies validated the tenets of OSL theory and demonstrated the significant effect of OSL on consumers' exploratory behavior and variety seeking as well as on their adoption of new and innovative products and services. However, few studies have explored the internal process and underlying mechanism driving such effect. Thus far, our knowledge about the mechanism that transmits the effect of OSL on individual behavior and decision-making has been scarce. Such knowledge is critical to our theoretical understanding and to providing guidance and prescriptions for effective interventions in the individual decision-making process (Baron & Kenny, 1986; MacKinnon, 2008; Preacher, 2015; Shrout & Bolger, 2002). Therefore, from both theoretical and practical standpoints, researchers should explore and validate the influence mechanism of OSL on individual behavior and decision-making. Accordingly, this study attempts to develop a theoretically grounded mediation model explaining the effect of OSL on two critical drivers (i.e., PEOU and PU) underlying individual adoption of IT innovations.

Unlike the extensive research in marketing and consumer behavior literature, the application of OSL theory has been limited and scattered in the IS field (see Table 1). Little research (except for Mahatanankoon (2007)) has investigated the role of OSL in individual acceptance and use of IT innovations. Moreover, studies in the IS field, with the exceptions of Wosczynski et al. (2002) and Chen et al. (2011), share a common feature with those in the marketing field: they have related OSL directly to individual behavior or behavioral intention. They did not elucidate the theoretical process and mechanisms
underlying such relations. Furthermore, the literature is confusing, and some studies appear to be conceptually contradictory. For example, Woszczynski et al. (2002) claimed that OSL is a distal antecedent of PIIT, whereas Mahatanankoon (2007) suggested that PIIT affects OSL. Obviously, researchers must ponder the nature of the relationships and articulate theoretically justified linkages between OSL and related constructs. In this study, we employed trait hierarchical model (see the following section) as the organizing framework and delineated the nomological network of OSL with PIIT and CSE, which serve as the variables that mediate the influence of OSL on individuals’ PEOU and PU of IT innovations.

### Trait Hierarchical Model

Individuals’ traits refer to the individuals’ enduring predispositions to respond to stimuli across situations (Thatcher & Perrewé, 2002). The individuals’ traits’ influence on the interaction process and outcomes (such as cognitions, perceptions, and behaviors of individuals with stimuli) has been well documented. Personality psychologists have theoretically and empirically suggested that individuals’ traits differ in breadth and that the interrelations of traits can be represented in the form of a hierarchical model, within which the arrangement is based on trait breadth (Allport, 1961; Hampson, John, & Goldberg, 1986; Paunonen, 1998). Trait breadth is defined as the number of distinct behaviors subsumed in a trait or included in the trait’s meaning (Hampson et al., 1986). It reflects the diversity extent of a trait’s behavioral manifestations (Hampson et al., 1986). The more diverse the behavioral manifestations are, the broader the trait is. For instance, when an individual is labeled as talkative, it means that, in general, the individual manifests a considerable level of activeness and willingness in initiating and participating in conversational activities with other individuals. In comparison, when an individual is labeled as extraverted, it means that the individual manifests not only the aforementioned talkative characteristics but also other characteristics, such as being friendly, sociable, warm, fun-loving, and affectionate, that jointly define the extraversion trait as well (McCrae & Costa, 1987). In this regard, extraversion is a broader trait than talkativeness.

On the basis of trait breadth, individual traits in the same domain can be organized in a hierarchical fashion such that broad traits reside at a high level and narrow traits occupy the low level (Allport, 1961; Hampson et al., 1986; Paunonen, 1998). In a trait hierarchy, the behavioral instances referred to by low-level traits are a subset of those referred to by the immediate higher-level traits. Multiple low-level traits combine to form a high-level trait, which, in turn, combines with other correlated same-level traits to form yet higher-level ones. Personality psychologists have suggested that high-level traits can be obtained through a factor analytical approach to low-level ones. For instance, the five-factor personalities of the FFM have been identified through factor analysis of a number of their constitutive low-level traits (McCrae & Costa, 1987). Influence relationships exist between traits of different levels in the same domain, with low-level traits influenced by high-level ones (Davis & Yi, 2012; Mowen, 2000). That is, the variation of high-level traits drives the variance in low-level ones. One can predict individuals’ low-level traits from their high-level ones. For instance one can predict that an

<table>
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<tr>
<th>Studies (in Chronological Order)</th>
<th>Research Topic</th>
<th>Research Findings</th>
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<tr>
<td>Lavin, Marvin, McLarney, Nola, &amp; Scott (1999)</td>
<td>Internet dependence</td>
<td>- Internet dependents scored significantly lower on OSL than Internet non-dependents.</td>
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<tr>
<td>Lin &amp; Tsai (2002)</td>
<td>Internet dependence</td>
<td>- Internet dependents scored significantly higher on OSL than Internet non-dependents.</td>
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<tr>
<td>Woszczynski, Roth, &amp; Segars (2002)</td>
<td>Playfulness in computer interactions</td>
<td>- OSL positively affects flow state and playful behaviors in computer interactions. *</td>
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| Mahatanankoon (2007) | Mobile commerce | - PIIT positively affects OSL.  
- OSL positively affects text messaging use and mobile commerce intention. |
- Computer risk taking propensity positively affects individuals’ attitude and ultimately influences read intention of commercial emails. |
| Wang, Jackson, Zhang, & Su (2012) | SNS usage | - OSL is positively related with playing games on SNSs. |
| Lin, Ku, & Huang (2014) | Innovative IT championing behavior | - OSL positively affects top managers’ innovative IT championing behavior. |

* hypotheses without empirical testing. 

### Table 1. IS Literature on OSL Theory
extremely extraverted individual is highly likely to have the trait of talkativeness, which is a low-level trait defining extraversion.

Several trait hierarchical models have been proposed by different researchers. For instance, Eysenck (1947) suggested a three-tier hierarchical model (Figure 1). Within the model, several specific responses or narrow behaviors define the individuals' habitual response pattern, which resides at the first level. Several such habitual response tendencies combine to form the individuals' specific trait, which resides at the second level. In addition, several correlated individuals' specific traits constitute the individuals' broad factor of personality, which resides at the top level. Extending prior researchers' trait hierarchical models by integrating with control theory and evolutionary psychology principles, Mowen (2000) proposed a four-level hierarchical model. He theorized and empirically confirmed that the big five personality factors and three additional traits, namely, the need for arousal (i.e., the general need for stimulation), the need for body resources (i.e., the general need for enhancement and protection of physical resources), and the need for material resources (i.e., the general need for material items), constitute the eight elemental traits that reside at the top level of the hierarchy. Recently, Davis & Yi (2012) developed a three-tier hierarchical model of traits tailored to IT contexts (Figure 2). In that hierarchy, broad and general personality factors (e.g., the big five personalities) are at the cardinal tier, IT-domain stable traits (e.g., PIIT) are located at the central tier, and IT-domain dynamic traits (e.g., CSE) are at the lowest tier (which is called the secondary tier). High-tier traits are predictive of low-tier ones, and the central traits (i.e., IT-domain stable traits) mediate the effects of the cardinal traits (i.e., broad personality traits) on secondary ones (i.e., IT-domain dynamic traits). In the current study, we adopted Davis and Yi's (2012) three-tier trait hierarchical model as the theoretical framework for unveiling the influence mechanism of OSL on individuals' PEOU and PU of IT innovations because the model has been developed typically for IT contexts, thus rendering it suitable for our study.
psychology, the five-factor structure of personality has been criticized for several of its inherent issues. For instance, the identification of five personality factors lacks theoretical basis; instead, it has been based exclusively upon factor analysis methodology (Block, 1995, 2010; Epstein, 2010). Consequently, there is no theoretical justification for the five-factor structure of personality (Block, 1995, 2010; Epstein, 2010). Moreover, the original extraction of the five personality factors involved a very limited set of trait terms, which excludes evaluative terms (e.g., evil and deceivable), terms describing temporary states and activities (e.g., happy and fearful), terms not used in polite parlance, and common-language adjectives that are infrequently employed (Almagor et al., 1995; Block, 2010; Veselka et al., 2012). Such arbitrary exclusion of trait terms has prevented the identification of other personality factors that have important theoretical and practical implications (Almagor et al., 1995; Block, 2010; Veselka et al., 2012). Furthermore, the unreasonable criterion used to extract personality factors from trait terms (see Paunonen & Jackson 2000 for details) has exacerbated the issue associated with the identification of personality factors. Consequently, the five-factor structure fails to provide a complete and sufficient representation of human personality (Almagor et al., 1995; Block, 2010; Epstein, 2010; Veselka et al., 2012).

A growing number of studies have recently demonstrated that some broad traits outside the five-factor personalities have substantial predictive power for individual behavior. For instance, O'Neill & Hastings (2011) found that integrity, religiosity, risk-taking, egotism, and manipulativeness (which were identified by Paunonen & Jackson 2000) in their reanalysis of Saucier & Goldberg's (1998) BF data accounted for a considerably larger proportion of variance in individuals' workplace deviant behavior than the BF factors. Moreover, Hong et al. (2012) suggested that other than the FFM factors, the inclusion of integrity, risk-taking, and seductiveness (likewise identified by Paunonen & Jackson 2000)), significantly increased the variance explained in individuals' unethical behavioral intention. Many such studies (e.g., Hong et al., 2012; O'Neill & Hastings, 2011; Scherer, Baysinger, Zolynsky, & LeBreton, 2013) as well as personality theorists (e.g., Almagor et al., 1995; Block, 2010; Epstein, 2010; Veselka et al., 2012) have underscored that heavy reliance on the five-factor-personality paradigm has hindered theoretical advancement in research, and we must move beyond the five-factor personalities to explore other important personality traits in conducting personality-related research. Therefore, our study, which distinguishes itself from Davis and Yi (2012) by examining the effect of the broad personality trait, OSL, on individuals' PEOU and PU of IT innovations, represents an important contribution to knowledge.

Research Model and Hypotheses

We first drew upon OSL theory to theorize that OSL has a significant and positive effect on individuals' PEOU and PU of IT innovations. We then employed Davis and Yi's (2012) three-tier trait hierarchical model as the theoretical lens to uncover the mechanism underlying the effect of OSL on PEOU and PU. Theoretical and empirical evidence suggests that IT domain-specific traits are significant determinants of individuals' PEOU and PU of IT innovations (Agarwal & Prasad, 1998; Jackson, Yi, & Park, 2013; Lewis et al., 2003). Given that OSL is a broad and general personality trait, Davis and Yi's (2012) trait hierarchical model, a theory-grounded integrative model of broad personality and IT domain-specific traits, is particularly suitable for our research purpose.

Applying the model of Davis & Yi (2012), we selected PIIT and CSE as the central-tier trait and secondary-tier trait for our study, respectively. The reasons are as follows. First, PIIT has its theoretical roots in IDT (Rogers, 1983) and reflects individual explorativeness and innovativeness in accepting and using IT innovations (Agarwal & Prasad, 1998; Thatcher & Perrewé, 2002). As such, PIIT shares a common grounding with OSL in characterizing individual explorativeness and innovativeness. Therefore, PIIT is expected to relate closely to OSL, which makes PIIT a highly pertinent central-tier trait for our study. Second, unlike other stable IT domain-specific traits, such as computer playfulness, that have been theoretically and empirically suggested as determinants of PEOU and not of PU (Venkatesh & Bala, 2008), PIIT has received consistent support in affecting both individuals' PEOU and PU of IT innovations (e.g., Jackson et al., 2013; Lewis et al., 2003; Yi et al., 2006). As such, PIIT is a better choice as a mediating variable in the effects of OSL on PEOU and PU than other stable IT domain-specific traits. Third, compared with other dynamic IT domain-specific traits, such as computer anxiety, CSE has gained wider empirical support with regard to relationships with both PIIT (Agarwal, Sambamurthy, & Stair, 2000; Davis & Yi, 2012; Lewis et al., 2003; Thatcher & Perrewé, 2002) and PEOU (Agarwal et al., 2000; Hong, Thong, Wong, & Tam, 2002; Lewis et al., 2003; Venkatesh & Bala, 2008; Venkatesh & Davis, 1996). The existence of much empirical evidence offers us a strong basis to theorize the mediation effect of CSE on the mediation effect of PIIT on the OSL-PEOU relation. Taken together, therefore, we selected PIIT and CSE as the mediation mechanisms through which OSL transmits its influence on individuals’ PEOU and PU of IT innovations.
Figure 3 presents a visual overview of our proposed hypotheses. For the sake of model completeness in this study, we also developed a hypothesis regarding the effect of PEOU on PU, which has been widely validated in extant IS literature. The following subsections present the theoretical arguments for our hypotheses.

**Relating OSL to PEOU and PU**

According to OSL theory, high-OSL individuals require a higher level of stimulation than low-OSL individuals to feel comfortable and satisfied. They also have a stronger desire to approach and explore activities and situations, which are novel, changing, and complex (Kish & Donnenwerth, 1972; Raju, 1980). Consequently, when exposed to the same stimulus, high-OSL individuals are more likely than their counterparts to try and experience the stimulus. In the trying process, they are also more innovative and risk taking (Mittelstaedt et al., 1976; Raju, 1980). Therefore, in an IT innovation context, high-OSL individuals are more likely to explore and learn about IT innovations. Moreover, motivated by a strong need for stimulation, high-OSL individuals are likely to enjoy exploring and learning about IT innovations because tackling problems and difficulties encountered in the exploring and learning processes increases the stimulus input, thus offering individuals a high level of stimulation (Baumgartner & Steenkamp, 1994; Berlyne, 1960). Consequently, high-OSL individuals may not perceive as much difficulty as low-OSL individuals in exploring and learning about IT innovations. Therefore, they are likely to perceive a higher level of ease of use regarding using IT innovations compared with low-OSL individuals.

Our reasoning above is essentially consistent with prior theorizations. Hoffman and Novak (1996) suggested that high-OSL individuals are likely to have flow experience in a computer-mediated environment because they tend to seek out challenges to obtain congruence with their skills, creating a prerequisite for the occurrence of flow. Likewise, Woszczynski et al. (2002) indicated that high-OSL individuals are more likely than low-OSL individuals to experience a flow state in computer interactions because they are more fond of exploring and dealing with challenges.

Moreover, prior research has found that high-OSL individuals possess a high level of tolerance of ambiguity (Raju, 1980). Tolerance of ambiguity refers to individuals’ “tendency to perceive ambiguous situations as desirable” (Budner, 1962, p. 29). This means that high-OSL individuals are predisposed to embrace ambiguous situations, which are typically characterized by “novelty, complexity, or insolubility” (Budner, 1962, p. 30). Therefore, when dealing with ambiguous situations, high-OSL individuals are better prepared psychologically for the possible problems and difficulties emerging in the dealing process. Moreover, the high-OSL individuals’ innate acceptance of ambiguous situations inclines them to be more optimistic and feel more competent in dealing with ambiguous situations (Raju, 1980). Consequently, high-OSL individuals are likely to perceive a higher level of ease in dealing with ambiguous situations than low-OSL individuals. When exploring and learning about IT innovations, individuals are also dealing with an ambiguous situation. That is because IT innovations are new to individuals, problems and difficulties that may arise in individuals’ exploring and learning processes are unknown beforehand and cannot be completely and accurately predicted. Therefore, in an IT innovation context, it is conceivable...
that high-OSL individuals are likely to perceive a high level of ease in exploring and learning about IT innovations and thus are likely to perceive a high level of PEOU of IT innovations. Therefore, we hypothesize the following:

Hypothesis 1 (H1): OSL has a positive effect on individuals’ PEOU of IT innovations.

As mentioned previously, high-OSL individuals are more active in exploring and learning about IT innovations than their counterparts. Consequently, they generate more opportunities for themselves to recognize and appreciate the utilities and benefits derived from the usage of IT innovations. Prior research suggested that OSL is positively associated with openness to experience (Aluja et al., 2003; Vries et al., 2009) and negatively related to rigidity (Raju, 1980). Preference for variety, liberalism, and broad interests are the key definers of openness to experience (McCrae & Costa, 1987), hence high-OSL individuals are more accepting of IT innovations and their stimulating use than low-OSL individuals. This innate inclusiveness and optimism facilitate the formation of positive perceptions, such as views of usefulness toward the usage of IT innovations. Furthermore, when faced with uncertain and risky activities, high-OSL individuals are predisposed to have an overall positive evaluation such that the benefits derived from engaging in such activities are perceived to be greater than the costs incurred (Maslowsky et al., 2011). In an IT innovation context, therefore, high-OSL individuals are more likely to perceive usefulness from the usage of IT innovations compared with low-OSL individuals. Therefore, we hypothesize the following:

Hypothesis 2 (H2): OSL has a positive effect on individuals’ PU of IT innovations.

Davis (1989) initially suggested that PEOU is a possible antecedent to PU in the development of the TAM, and a sizable body of literature has empirically demonstrated that PEOU has a significant positive effect on PU across various contexts and domains (e.g., Agarwal & Prasad, 1999; Devaraj et al., 2008; King & He, 2006; Venkatesh & Davis, 2000). Therefore, we hypothesize the following:

Hypothesis 3 (H3): PEOU has a positive effect on PU.

Mediation Effects of PIIT

PIIT refers to “the willingness of an individual to try out any new information technology” (Agarwal & Prasad, 1998, p. 206). It is a stable IT domain-specific trait that reflects individuals’ explorativeness and innovativeness in accepting and using IT innovations (Agarwal & Prasad, 1998; Thatcher & Perrewé, 2002). Meanwhile, OSL is a general personality trait that defines individuals’ general need for stimulation, which is determined by the novelty, uncertainty, and complexity of stimuli. Both OSL and PIIT clearly reflect individual explorativeness and innovativeness but at different levels of trait breadth, with the former at the broad and general level (Mowen, 2000; Steenkamp, 2010) and the latter at the domain-specific level (Agarwal & Prasad, 1998; Davis & Yi, 2012; Thatcher & Perrewé, 2002). The trait hierarchical model proposes that broad traits influence their associated narrow traits and that the former is predictive of the latter (Davis & Yi, 2012; Mowen, 2000). Therefore, with regard to the traits OSL and PIIT, OSL influences PIIT, and a high level of OSL predicts a high level of PIIT.

OSL theory suggests that high-OSL individuals have a stronger desire to seek out and approach novel, changing, and uncertain activities and situations; thus, they are more willing to try new and unfamiliar things compared with low-OSL individuals (Kish & Donnenwerth, 1972). Applying the theorization to an IT innovation context, we may infer that high-OSL individuals’ stronger-than-average need for stimulation will be manifested in the way that they have a stronger desire to experience and experiment with IT innovations and are more willing to be the initial adopters compared with low-OSL individuals. Therefore, individuals’ OSL predicts their innovativeness in the domain of IT innovations such that a high level of OSL predicts a high level of PIIT. Indeed, Mahatanankoon (2007) found a positive correlation between OSL and PIIT. Moreover, several studies have shown that high-OSL individuals are more likely to be innovators in the IT domain. For example, Fiore et al. (2005) discovered that OSL predicts individuals’ attempts to use the image interactivity technology offered on apparel retail websites. Mahatanankoon (2007) found that OSL predicts individuals’ use of mobile devices for complex and exploratory applications. In summary, both theoretical analysis and prior research findings lead us to expect a positive effect of OSL on PIIT.

In the conceptualization of PIIT, Agarwal and Prasad (1998) suggested that PIIT exerts its influence on individuals’ technology acceptance via its effects on individual perceptions and beliefs; individuals with a high level of PIIT tend to develop positive perceptions and beliefs regarding IT innovations. Indeed, numerous researchers (e.g., Jackson et al., 2013; Lewis et al., 2003; Yi et al., 2006) have found empirical support for the positive impact of PIIT on individuals’ PEOU and PU across different IT innovation contexts. For example, Lewis et al. (2003) uncovered that high-PIIT university faculty members have a high level of PEOU and PU regarding the use of course websites in their teaching activities. Therefore, on the basis of
theoretical arguments regarding the effect of OSL on PIIT and according to prior theoretical and empirical evidence on the effects of PIIT on PEOU and PU (e.g., Agarwal & Prasad, 1998; Jackson et al., 2013; Lewis et al., 2003; Yi et al., 2006), we posit that OSL exerts its influence on individuals’ PEOU and PU of IT innovations via its epitomization in the IT domain, namely, the stable IT domain-specific trait, PIIT. Thus, we hypothesize the following:

Hypothesis 4a (H4a): PIIT mediates the effect of OSL on PEOU.

Hypothesis 4b (H4b): PIIT mediates the effect of OSL on PU.

As theorized above, high-OSL individuals are inclined to possess a higher level of PIIT than low-OSL individuals. That means high-OSL individuals are more likely to manifest the characteristics of being a high-PIIT individual than their counterparts. Specifically, when exposed to IT innovations, they are more active in exploring and experimenting (Agarwal & Prasad, 1998), which creates more opportunities for them to try, learn about, and ultimately master IT innovations (Agarwal et al., 2000). Consequently, all else being equal, when facing computer-related technologies, high-OSL individuals have more confidence in their ability to competently use the technologies. Following this logic, compared with low-OSL individuals, high-OSL individuals are expected to have higher levels of both PIIT and CSE. Mapped to the trait hierarchical model of Davis and Yi (2012), as a general personality trait OSL resides at the cardinal tier of the hierarchy. PIIT remains at the central tier, and as a dynamic IT domain-specific trait, CSE is at the secondary tier. According to the trait hierarchical model, central-tier traits mediate the effects of cardinal-tier traits on secondary-tier traits. Thus, in line with the trait hierarchical model, we posit that:

Hypothesis 4c (H4c): PIIT mediates the effect of OSL on CSE.

Three-Path Mediation Effect of PIIT and CSE

Lord, De Vader, and Alliger (1986) suggested that personality traits shape individuals’ judgment of their abilities. Bandura (1997) also proposed that personality traits affect individuals’ performance via the mediated effect of self-efficacy. Both OSL and PIIT are individual traits that reflect individual explorativeness and innovativeness. Extant studies have indicated that PIIT influences CSE (Agarwal et al., 2000; Davis & Yi, 2012; Thatcher & Perrewé, 2002), which, in turn, impacts PEOU (Agarwal et al., 2000; Venkatesh & Davis, 1996). Therefore, drawing upon scholars’ theorizations (Bandura, 1997; Lord et al., 1986) and empirical findings (Agarwal et al., 2000; Davis & Yi, 2012; Thatcher & Perrewé, 2002; Venkatesh & Davis, 1996), we propose a three-path mediation effect of PIIT and CSE on the impact of OSL on PEOU.

High-PIIT individuals are more willing to try IT innovations and are more capable of coping with the uncertainty and risks confronted during the trying process than low-PIIT individuals (Agarwal & Prasad, 1998). They demonstrate more confidence about the competency of using new technologies (Agarwal et al., 2000). Therefore, PIIT has a positive effect on CSE. Indeed, the positive impact of PIIT on CSE has been empirically validated in prior studies (e.g., Agarwal et al., 2000; Davis & Yi, 2012; Thatcher & Perrewé, 2002).

The effect of CSE on PEOU can be observed from their conceptual relationship (Davis, 1989; Venkatesh & Davis, 1996). CSE refers to individuals’ confidence in their ability to use computer technologies to accomplish specific computer-related tasks (Compeau & Higgins, 1995). Meanwhile, PEOU indicates the degree to which an individual believes that using a particular system would be free of effort (Davis, 1989). As inferred from those conceptual definitions, individuals with high CSE tend to have a high level of confidence in using a particular system to accomplish tasks, and their beliefs regarding the ease of using the system are higher than low-CSE individuals. Indeed, CSE is suggested to provide an anchor for individuals to judge the ease of use of IT systems (Venkatesh & Davis, 1996). For example, Venkatesh and Davis (1996) found that users with high CSE perceive a high level of ease of use both before and after the experience with IT systems. Furthermore, Lewis et al. (2003) and Venkatesh and Bala (2008) both revealed the significant positive impact of CSE on PEOU. Therefore, as we propose that PIIT mediates the impact of OSL on PEOU, we further hypothesize that:

Hypothesis 5 (H5): CSE mediates the mediation effect of PIIT on the OSL-PEOU relation.

Research Method

Research Context and Sample

To test the proposed hypotheses, we chose as the research context the multi-homing on social networking sites (SNSs), i.e., the simultaneous use of multiple SNSs, for two reasons. First, as one of the most influential IT innovations in recent years, SNSs have attracted tremendous interest from scholars and practitioners (Agarwal, Gupta, & Kraut, 2008; Aral, Dellarocas, & Godes, 2013; Kane, Alavi, Labianca, & Borgatti, 2014). Given the pervasive and significant impact of SNSs on individuals, organizations, and on society, SNS research has emerged as one of the most significant IS research areas in recent years (Agarwal et al., 2008; Aral et al., 2013; Kane et al., 2014). This study can contribute to the SNS literature.
by exploring the impact of OSL on individual perceptions of SNS use. Second, as the adoption of SNSs has become more common, the explorativeness and innovativeness of adopting a particular SNS has substantially decreased. Compared to the adoption of a single SNS, the simultaneous use of multiple SNSs, which has been identified in several studies (e.g., Kisekka, Bagchi-Sen, & RagHAV Rao, 2013; Litt, 2013), possesses a stronger exploratory and stimulating component because of the higher level of diversity and complexity in SNS choice (Jimenez-Martin & Ladrón-de-Guevara, 2007; Steenkamp, 2010). OSL and PIIT are both individual traits that reflect individual explorativeness and innovativeness, and prior research has suggested that OSL is associated with individuals’ use of multiple products or services of the same category. Consequently, this study chose the multi-homing use of SNSs over the adoption of a single SNS as the research context.

As the research aim of this study is to validate the hypothesized relationships between individuals’ traits and perceptions regarding the use of IT innovations, we collected survey data from 383 students at a large public university in China. Among our respondents, 234 (61.1 percent) were full-time students and 149 (38.9 percent) were part-time MBA students who were employed adults. 50.9 percent of the subjects were male and 49.1 percent were female. 46.7 percent were between 24–27 years old, followed by 37.6 percent who were between 19–23, and 15.7 percent were older than 27 years. Noticeably, a considerable proportion of the participants (85.6 percent) reported multi-homing use of SNSs.

Operationalization of Constructs

All constructs were measured using previously validated scales, with adaptation to the research context where necessary. Table 2 presents the measurement items and the sources. As noted in the Optimum Stimulation Level Theory section, several scales measuring OSL exist in literature. In this study, we chose the short-form Change Seeker Index (CSI) of Steenkamp and Baumgartner (1995) as the measurement scale of OSL for three reasons. First, the short-form CSI is derived from CSI, whose unidimensionality has received consistent empirical support across studies (Grande, 2005; Steenkamp & Baumgartner, 1992). Second, the short-form CSI has better psychometric properties and nomological validity than its original scale CSI (Steenkamp & Baumgartner, 1995). Third, compared with the 95-item CSI, the short form only has seven items, thereby alleviating respondent fatigue and rendering the scale more practical to use (Steenkamp & Baumgartner, 1995; Steenkamp & Burgess, 2002). In fact, the short-form CSI has been adopted by many OSL researchers and has exhibited consistently satisfactory psychometric properties (e.g., Helm & Landschulze, 2009; Lin et al., 2014; Steenkamp & Burgess, 2002).

All items, except for the items of OSL and CSE, were assessed with a 7-point Likert-type scale, ranging from “strongly disagree” to “strongly agree.” OSL was measured on a 7-point scale with 1 = completely false and 7 = completely true. Following Compeau and Higgins (1995), computer self-efficacy was measured on an 11-point scale with 0 = No (indicating that respondents think that they would be unable to complete the job using the software package), 1 = not at all confident, and 10 = totally confident.

To account for alternative explanations of variances in PEOU and PU, aside from the theoretical constructs as specified in Figure 3, we included gender and prior experience as control variables as prior research (Agarwal & Prasad, 1999; Gefen & Straub, 1997) has established that they impact individuals’ PEOU and PU of IT innovations. Gender was coded as a binary variable, with males as 0 and females as 1, and prior experience with SNSs was measured by asking participants how many years they have used SNSs.

As the original measures were in English, we employed the back-translation method to ensure consistency between the original English and the Chinese instruments (Craig & Douglas, 2005). The preliminary questionnaire was examined by a panel of experts, consisting of three IS professors and six doctoral students, to assess construct validity and wording ambiguity. Next, the questionnaire was pilot tested with 21 SNS users with at least half a year of SNS experience. Feedback obtained suggested that substantial changes to the questionnaire were unnecessary. None of the pilot test participants was included in the data analysis reported in this study.

Data Analysis and Results

This study used structural equation modeling (SEM) as the data analysis approach because it can simultaneously examine relationships among multiple independent and dependent constructs (Gefen, Straub, & Boudreau, 2000), which is especially relevant for testing mediation effects. SEM allows for a more complete modeling of theoretical relations compared to the regression analyses of mere associations among measures (Bagozzi & Yi, 1989). It analyzes measurement and structural models concurrently and incorporates measurement error into models (Gefen et al., 2000). The covariance-based SEM (CBSEM) was chosen for data analysis because of its ability to compare models based on model fit indices, which is particularly useful for comparisons of our proposed mediated model with alternative models (Gefen et al., 2000). The CBSEM software IBM SPSS Amos 22 (Arbuckle, 2013) was used.
### Table 2. Measurement Items of Constructs and Sources

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Items</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimum stimulation level (OSL)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSL_1</td>
<td>I like to continue doing the same old things rather than trying new and different things.*</td>
<td>Steenkamp &amp; Baumgartner (1995)</td>
</tr>
<tr>
<td>OSL_2</td>
<td>I like to experience novelty and change in my daily routine.</td>
<td></td>
</tr>
<tr>
<td>OSL_3</td>
<td>I like a job that offers change, variety, and travel, even if it involves some danger.</td>
<td></td>
</tr>
<tr>
<td>OSL_4</td>
<td>I am continually seeking new ideas and experiences.</td>
<td></td>
</tr>
<tr>
<td>OSL_5</td>
<td>I like continually changing activities.</td>
<td></td>
</tr>
<tr>
<td>OSL_6</td>
<td>When things get boring, I like to find some new and unfamiliar experience.</td>
<td></td>
</tr>
<tr>
<td>OSL_7</td>
<td>I prefer a routine way of life to an unpredictable one full of change.*</td>
<td></td>
</tr>
<tr>
<td>Personal innovativeness in information technology (PIIT)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIIT_1</td>
<td>If I heard about a new information technology, I would look for ways to experiment with it.</td>
<td>Agarwal &amp; Prasad (1998)</td>
</tr>
<tr>
<td>PIIT_2</td>
<td>Among my peers, I am usually the first to try out new information technologies.</td>
<td></td>
</tr>
<tr>
<td>PIIT_3</td>
<td>In general, I am hesitant to try out new information technologies.*</td>
<td></td>
</tr>
<tr>
<td>PIIT_4</td>
<td>I like to experiment with new information technologies.</td>
<td></td>
</tr>
<tr>
<td>Computer self-efficacy (CSE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSE_1</td>
<td>I could complete the job using the software package</td>
<td>Compeau &amp; Higgins (1995)</td>
</tr>
<tr>
<td>CSE_2</td>
<td>If there was no one around to tell me what to do as I go.</td>
<td></td>
</tr>
<tr>
<td>CSE_3</td>
<td>If I had never used a package like it before.</td>
<td></td>
</tr>
<tr>
<td>CSE_4</td>
<td>If I had only the software manuals for reference.</td>
<td></td>
</tr>
<tr>
<td>CSE_5</td>
<td>If I had seen someone else using it before trying it myself.</td>
<td></td>
</tr>
<tr>
<td>CSE_6</td>
<td>If someone else had helped me get started.</td>
<td></td>
</tr>
<tr>
<td>CSE_7</td>
<td>If I had a lot of time to complete the job for which the software was provided.</td>
<td></td>
</tr>
<tr>
<td>CSE_8</td>
<td>If I had just the built-in help facility for assistance.</td>
<td></td>
</tr>
<tr>
<td>CSE_9</td>
<td>If someone showed me how to do it first.</td>
<td></td>
</tr>
<tr>
<td>CSE_10</td>
<td>If I had used similar packages before this one to do the same job.</td>
<td></td>
</tr>
<tr>
<td>Perceived ease of use regarding multi-homing on SNSs (PEOU)</td>
<td>Learning to use multiple SNSs would be easy for me.</td>
<td>Karahanna, Straub, &amp; Chervany (1999); Venkatesh &amp; Davis (2000)</td>
</tr>
<tr>
<td>PEOU_1</td>
<td>If I were to adopt multiple SNSs, it would be easy to use.</td>
<td></td>
</tr>
<tr>
<td>PEOU_2</td>
<td>If I were to adopt multiple SNSs, it would be difficult to use.*</td>
<td></td>
</tr>
<tr>
<td>PEOU_4</td>
<td>Using multiple SNSs does not require a lot of my mental effort.</td>
<td></td>
</tr>
<tr>
<td>Perceived usefulness regarding multi-homing on SNSs (PU)</td>
<td>Using multiple SNSs will be of no benefit to me.*</td>
<td>Taylor &amp; Todd (1995); Venkatesh &amp; Davis (2000)</td>
</tr>
<tr>
<td>PU_1</td>
<td>Overall, using multiple SNSs will be advantageous.</td>
<td></td>
</tr>
<tr>
<td>PU_2</td>
<td>I would find using multiple SNSs useful in my daily life.</td>
<td></td>
</tr>
</tbody>
</table>

*: reverse items, †: additional instructions were provided per Compeau & Higgins (1995).

### Measurement Model Evaluation

The measurement quality of scales was assessed prior to testing the hypotheses. A confirmatory factor analysis (CFA) was performed using Amos. Analysis results revealed that several items have loadings lower than the cutoff value 0.707 (Gefen et al., 2000; Nunnally & Bernstein, 1994). Consequently, four items were dropped from the following analyses (OSL_1, OSL_7, PIIT_3, and PEOU_4). The resulting measurement model was further revised by individually dropping items that shared a high degree of residual variance with other items (i.e., standardized residual covariance larger than 2.58), in accordance with the standard CBSEM methodology (Gefen, 2003; Gefen et al., 2000). Consequently, two items measuring CSE (CSE_1 and CSE_10) were dropped. After the dropping of said items, the CFA showed acceptable model fit statistics ($\chi^2 = 498.87, df = 199, p < 0.001, \chi^2/df = 2.51$, comparative fit index (CFI) = 0.95, Tucker–Lewis index (TLI) = 0.94, root mean square error of approximation (RMSEA) = 0.06, standardized root mean residual (SRMR) = 0.04).

We then examined the psychometric properties of constructs, namely, convergent validity, discriminant validity, and reliability. Convergent validity was established by the average variance extracted (AVE) of constructs greater than 0.5 (Fornell & Larcker, 1981) and items loading on their intended constructs at 0.707 or higher (Gefen et al., 2000; Nunnally & Bernstein,
Reliability of constructs (composite reliability and Cronbach's α) should be greater than the recommended threshold of 0.7 (Nunnally & Bernstein, 1994). For discriminant validity, the square root of AVE for each construct should exceed the construct’s correlations with other constructs (Fornell & Larcker, 1981; Gefen et al., 2000). Fixing the correlation between any pair of constructs at 1 should result in a significant increase in the $\chi^2$ value of the measurement model (Gefen et al., 2000; Segars, 1997). As shown in Tables 3, 4, and 5, our scales meet the requirements for psychometric properties (except that the loadings of CSE_2 and OSL_6 are 0.705 and 0.687, respectively, which are slightly below 0.707). Descriptive statistics of the constructs are presented in the first five columns of Table 4.

Table 3. Item Loadings

<table>
<thead>
<tr>
<th></th>
<th>CSE</th>
<th>OSL</th>
<th>PEOU</th>
<th>PIIT</th>
<th>PU</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE_2</td>
<td>0.705</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSE_3</td>
<td>0.842</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSE_4</td>
<td>0.858</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSE_5</td>
<td>0.841</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSE_6</td>
<td>0.876</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSE_7</td>
<td>0.816</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSE_8</td>
<td>0.792</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSE_9</td>
<td>0.765</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>OSL_2</td>
<td>0.750</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSL_3</td>
<td>0.815</td>
<td></td>
<td></td>
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<tr>
<td>OSL_4</td>
<td>0.814</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSL_5</td>
<td>0.832</td>
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<td></td>
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<tr>
<td>OSL_6</td>
<td>0.687</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEOU_1</td>
<td></td>
<td>0.842</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEOU_2</td>
<td></td>
<td>0.948</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>PEOU_3</td>
<td></td>
<td>0.804</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIIT_1</td>
<td></td>
<td></td>
<td>0.830</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIIT_2</td>
<td></td>
<td></td>
<td>0.775</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIIT_4</td>
<td></td>
<td></td>
<td>0.842</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PU_1</td>
<td></td>
<td></td>
<td></td>
<td>0.829</td>
<td></td>
</tr>
<tr>
<td>PU_2</td>
<td></td>
<td></td>
<td></td>
<td>0.968</td>
<td></td>
</tr>
<tr>
<td>PU_3</td>
<td></td>
<td></td>
<td></td>
<td>0.918</td>
<td></td>
</tr>
</tbody>
</table>

Note: all item loadings are significant at p < 0.001.

Common Method Bias

Common method bias (CMB) is “systematic variance attributable to common measurement artifacts that alter (e.g., inflate or deflate) correlations in the underlying constructs” (Chin, Thatcher, & Wright, 2012, p. 1004). It can result from multiple sources such as consistency motive, social desirability, common scale formats and anchors, and measurement context effects (e.g., constructs are measured simultaneously) (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). As this study employed a cross-sectional survey method and all the data were from a single source (i.e., an individual SNS user), CMB may pose a threat to the validity of our findings. Therefore, we followed the recommendation of Podsakoff et al. (2003) to take both procedural and statistical measures to address this threat. First, the instrument contains different scale anchors (e.g., completely true, totally confident, and strongly disagree) and formats (Likert and semantic differential) to create a methodological separation of measurement. This reduced the demand characteristics and minimized the consistency effect (Podsakoff et al., 2003). Second, the respondents were allowed to answer anonymously and they were assured that there are no right or wrong answers. They were also encouraged to answer questions as honestly as possible. Such measures reduced the respondents’ evaluation apprehension and thus mitigated the social desirability bias (Podsakoff et al., 2003).

Third, we performed a Harman’s single-factor test to statistically assess the extent of CMB (Podsakoff & Organ, 1986). All the variables in this study were loaded into an exploratory factor analysis. CMB exists when a single factor emerges or one factor accounts for a majority of the covariances in variables. Results showed the presence of six factors and none of the factors explained the majority of the covariances, suggesting that CMB did not pose a significant threat to this study. Finally, following the suggestion of Podsakoff et al. (2003), we added an unmeasured latent method factor to our measurement model and ran a CFA in Amos. In the CFA, items were loaded on their theoretical constructs as well as on the latent method factor. Results indicated that item loadings on

Table 4. Descriptive Statistics, Reliability, and Validity of Constructs

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Max</th>
<th>M</th>
<th>SD</th>
<th>CR</th>
<th>Cronbach’s α</th>
<th>AVE</th>
<th>CSE</th>
<th>OSL</th>
<th>PEOU</th>
<th>PIIT</th>
<th>PU</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE</td>
<td>0.98</td>
<td>10.00</td>
<td>7.57</td>
<td>1.67</td>
<td>0.94</td>
<td>0.94</td>
<td>0.66</td>
<td>0.81</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSL</td>
<td>1.53</td>
<td>7.00</td>
<td>4.94</td>
<td>1.07</td>
<td>0.89</td>
<td>0.89</td>
<td>0.61</td>
<td>0.25</td>
<td>0.78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEOU</td>
<td>1.00</td>
<td>7.00</td>
<td>5.53</td>
<td>1.09</td>
<td>0.90</td>
<td>0.90</td>
<td>0.75</td>
<td>0.34</td>
<td>0.16</td>
<td>0.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIIT</td>
<td>1.00</td>
<td>7.00</td>
<td>4.41</td>
<td>1.22</td>
<td>0.86</td>
<td>0.85</td>
<td>0.67</td>
<td>0.38</td>
<td>0.46</td>
<td>0.25</td>
<td>0.82</td>
<td></td>
</tr>
<tr>
<td>PU</td>
<td>1.00</td>
<td>7.00</td>
<td>5.14</td>
<td>1.27</td>
<td>0.93</td>
<td>0.93</td>
<td>0.82</td>
<td>0.19</td>
<td>0.19</td>
<td>0.41</td>
<td>0.35</td>
<td>0.91</td>
</tr>
</tbody>
</table>

Notes: M: mean, SD: standard deviation, CR: composite reliability; the bold diagonal elements are the square roots of AVEs of constructs; off-diagonal elements in the last five columns are correlations between constructs.
their theoretical constructs remain significant and were substantially higher than the loadings on the latent method factor. Therefore, we determined that CMB is not a serious concern in this study.

Hypotheses Validation

With an adequate measurement model and the ruling out of CMB, the proposed hypotheses were tested with Amos. As hypotheses H4a–H4c, and H5 involve a mediation structure, we followed the recommendations of Preacher and Hayes (2008), Williams and MacKinnon (2008), and Hayes (2009) to employ the bias-corrected (BC) bootstrapping method in the test because such method possesses multiple advantages over traditional methods, such as the Sobel test (Sobel, 1982) and the causal steps approach (Baron & Kenny, 1986). Following Preacher & Hayes (2008), we chose 5000 as the number of bootstrap samples.

Analysis of the structural model (Model 1) depicted in Figure 4 produced an acceptable model fit: $\chi^2 = 595.87$, $df = 241$, $p < 0.001$, $\chi^2/df = 2.47$, $CFI = 0.94$, $TLI = 0.93$, $RMSEA = 0.06$, $SRMR = 0.05$. All these fit statistics are within the recommended thresholds (see Endnote 7). As illustrated in Figure 4, the variables in the model explained 14 percent of variance in PEOU and 28 percent of variance in PU. OSL explained 21 percent of variance in PIIT, and together with PIIT explained 15 percent of variance in CSE. Table 6 presents the results of the hypotheses testing. An effect is considered significant at $p < 0.05$ if its BC bootstrap 95 percent confidence interval does not include 0 (Hayes, 2013; Preacher & Hayes, 2008). All BC bootstrap 95 percent confidence intervals in Table 6 (except for H4a) do not include 0. Therefore, all hypotheses (except for H4a) were supported.

We used a model comparison approach (Tanriverdi, 2005) to further validate the mechanism theorized to transmit the influence of OSL on PEOU and PU. Given the mediating role of PIIT and CSE in our proposed model, we examined two structural models (Models 2 and 3) developed based on Model 1. Model 2 was constructed by removing the direct paths from OSL to PEOU, PU, and CSE in Model 1. Consequently, OSL does not directly influence PEOU and PU in Model 2. Instead, OSL exerts indirect influence through PIIT and CSE. Model 3 was developed by removing the paths from OSL to PIIT and CSE and from PIIT to CSE in Model 1. Hence, Model 3 is a nonmediated model, in which PIIT and CSE do not act as mediators but are direct antecedents of PEOU and PU.

Table 7 summarizes the comparison of the models. Model 1 is comparable to Model 2 in model fit indices and Model 3 performs worst. As revealed by the amount of variances explained in PEOU and PU, Models 1 and 2 are equivalent in terms of explanatory power, and they perform better than Model 3. Model fit indices and explanatory power overlook model parsimony, thus, we followed prior researchers (Hong, Thong, & Tam, 2006; Li & Chau, 2009) to further compare the three models on the following indices: Akaike’s Information Criterion (AIC), Consistent AIC (CAIC), and Bayesian Information Criterion (BIC). The

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### Table 5. Pairwise Discriminant Validity Tests

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2 (200)$</td>
<td>531.14</td>
<td>546.70</td>
<td>593.99</td>
<td>559.67</td>
<td>520.73</td>
<td>563.68</td>
<td>526.41</td>
<td>531.79</td>
<td>537.75</td>
<td>526.47</td>
</tr>
<tr>
<td>$\Delta \chi^2$</td>
<td>32.27</td>
<td>47.83</td>
<td>95.12</td>
<td>60.80</td>
<td>21.86</td>
<td>64.81</td>
<td>27.54</td>
<td>32.92</td>
<td>38.88</td>
<td>27.60</td>
</tr>
</tbody>
</table>

Notes: the unconstrained measurement model: $\chi^2 (199) = 498.87$, all the $\chi^2$ differences $\Delta \chi^2$ are significant at $p < 0.0001$.

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Figure 4. Testing Results of Model 1
Table 6. Hypotheses Testing Results

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Point Estimate</th>
<th>SE</th>
<th>BC Bootstrap 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1  OSL→PEOU</td>
<td>0.15</td>
<td>0.05</td>
<td>(0.04, 0.25)</td>
</tr>
<tr>
<td>H2  OSL→PU</td>
<td>0.20</td>
<td>0.06</td>
<td>(0.07, 0.31)</td>
</tr>
<tr>
<td>H3  PEOU→PU</td>
<td>0.33</td>
<td>0.07</td>
<td>(0.20, 0.45)</td>
</tr>
<tr>
<td>Mediation effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H4a OSL→PIIT→PEOU</td>
<td>0.06</td>
<td>0.04</td>
<td>(-0.01, 0.15)</td>
</tr>
<tr>
<td>H4b OSL→PIIT→PU</td>
<td>0.18</td>
<td>0.05</td>
<td>(0.09, 0.30)</td>
</tr>
<tr>
<td>H4c OSL→PIIT→CSE</td>
<td>0.20</td>
<td>0.06</td>
<td>(0.11, 0.33)</td>
</tr>
<tr>
<td>H5  OSL→PIIT→CSE→PEOU</td>
<td>0.04</td>
<td>0.02</td>
<td>(0.02, 0.08)</td>
</tr>
</tbody>
</table>

Notes: SE: standard error, CI: confidence interval.

Table 7. Model Comparison Results

<table>
<thead>
<tr>
<th>Model fit indices</th>
<th>Recommended Thresholds</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>χ²/df</td>
<td>≤ 3:1</td>
<td>2.47</td>
<td>2.45</td>
<td>2.93</td>
</tr>
<tr>
<td>CFI</td>
<td>&gt; 0.90</td>
<td>0.94</td>
<td>0.94</td>
<td>0.92</td>
</tr>
<tr>
<td>TLI</td>
<td>&gt; 0.90</td>
<td>0.93</td>
<td>0.94</td>
<td>0.91</td>
</tr>
<tr>
<td>RMSEA</td>
<td>≤ 0.08</td>
<td>0.06</td>
<td>0.06</td>
<td>0.07</td>
</tr>
<tr>
<td>SRMR</td>
<td>≤ 0.08</td>
<td>0.05</td>
<td>0.06</td>
<td>0.13</td>
</tr>
<tr>
<td>Variance explained</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEOU</td>
<td>The higher, the better</td>
<td>14%</td>
<td>14%</td>
<td>12%</td>
</tr>
<tr>
<td>PU</td>
<td></td>
<td>28%</td>
<td>28%</td>
<td>26%</td>
</tr>
</tbody>
</table>

Model comparison indices

| AIC                      | 712.00                 | 710.16  | 826.90  |
| CAIC                     | 998.98                 | 987.25  | 1103.99 |
| BIC                      | 940.98                 | 931.25  | 1047.99 |

The general guideline is that the lower the three indices, the better the model (Hong et al., 2006; Li & Chau, 2009). Table 7 shows that Model 2 has the lowest and Model 3 has the highest AIC, CAIC, and BIC values. Therefore, Model 2 is the best model. This is understandable because Model 2 (excluding direct paths from OSL to PEOU, PU, and CSE) is more parsimonious than Model 1, given that Model 2 is close to Model 1 in terms of model fit indices and explanatory power. In summary, the model comparison results suggest that Model 2 is the best among the three models, which provides support for the mediating role of PIIT and CSE in the influence of OSL on PEOU and PU. Figure 5 illustrates the analysis results of Model 2.

Post-hoc Analysis

In the effect of OSL on PEOU, the mediation effect of PIIT (H4c) and the three-path mediation effect of PIIT and CSE (H5) were confirmed. These results raised a
relevant question: does CSE mediate the effect of PIIT on PEOU? We believe that answering this question can help us gain deeper insights into the influence mechanism of OSL on PEOU. However, to the best of our knowledge, the mediation effect of CSE on the PIIT–PEOU relationship remains unexplored in prior studies. Therefore, we conducted a post-hoc analysis of the mediation effect of CSE. Estimation of Model 1 in Amos suggested that the point estimate of the mediation effect from the original sample was 0.08, and the BC bootstrap 95 percent confidence interval was (0.04, 0.15). Therefore, CSE significantly mediates the effect of PIIT on PEOU.

Discussion

Discussion of Findings

This study adopted the trait hierarchical model as its overarching framework. It also drew upon OSL theory and upon the literature on TAM, PIIT, and CSE to explore the impact of OSL on individuals’ PEOU and PU in the context of multi-homing use of SNSs. The empirical results supported most of our hypotheses. Specifically, OSL was found to significantly affect both PEOU and PU. The findings are essentially consistent with the tenets of OSL theory. PIIT was found to significantly mediate the effect of OSL on PU. This result indicates that the influence of individuals’ general personality trait on individual perception in a particular domain operates through its influence on individuals’ stable trait that is specific to that domain. This study also found that PIIT alone does not significantly mediate but combines with CSE to form a mediator chain that transmits the effect of OSL on PEOU. These results indicate that the significant mediation effect in the OSL→PIIT→PEOU path may be because individuals’ dynamic domain-specific trait (i.e., CSE) accounts for a considerable amount of the mediation effect that operates underlying OSL's effect on PEOU. (As shown in Table 6, the mediation effect in the OSL→PIIT→PEOU path is 0.06 and the mediation effect in the OSL→PIIT→CSE→PEOU path is 0.04.)

In line with the rationale of the trait hierarchical model, we found that PIIT significantly mediates the effect of OSL on CSE. Note that the significant correlation between OSL and PIIT in this study was also verified in Mahatanankoon (2007). However, contrary to Mahatanankoon’s (2007) viewpoint that PIIT has an influence on OSL, we held that OSL precedes PIIT in the influence relationship. Although Mahatanankoon (2007) based his research on Raju’s (1980) research framework (in which OSL was positioned as a mediator in the relationship between personality traits and individuals’ general exploratory tendency), we opine that the personality traits in Raju’s framework refer to general and broad personality traits such as intolerance of ambiguity, which is studied in Raju (1980), and do not refer to domain-specific traits, such as PIIT.

Furthermore, Raju’s research framework (1980) has been suggested to lack both theoretical underpinning and empirical support (Joachimsthaler & Lastovicka, 1984).

In this study, we applied the trait hierarchical model as the theoretical lens and empirically found that PIIT mediates the effect of OSL on CSE. To further confirm the finding, we examined an alternative path model wherein PIIT (as the independent variable) was linked to OSL and CSE; moreover, OSL (as the mediator) was linked to CSE. Results revealed an insignificant mediation effect of OSL (point estimate = 0.05, SE = 0.04, BC bootstrap 95% CI = [–0.03, 0.14]), suggesting that OSL does not play a mediator role in the relationships with PIIT and CSE (Zhao, Lynch Jr, & Chen, 2010). These findings provide additional empirical support for our viewpoint that OSL affects PIIT and not the opposite.

Theoretical Implications

This study provides theoretical contributions in several ways. First, to our knowledge, this study is the first to theorize and empirically validate the nomological network among OSL, PIIT, and CSE, thus contributing to the research on trait hierarchical model. Mowen (2000) theorized and empirically confirmed individuals’ general need for stimulation (i.e., OSL) as one of the eight elemental traits residing at the top of the trait hierarchy. Many studies have employed and validated Mowen’s trait hierarchical model across various contexts. However, they were mostly conducted in the marketing and consumer behavior domain (e.g., Harris & Mowen, 2001; Licata, Mowen, Harris, & Brown, 2003; Mowen, 2004; Mowen & Carlson, 2003) and did not address the constructs of PIIT and CSE, which originate from the IS discipline. By contrast, Davis and Yi (2012) developed a trait hierarchical model tailored to IS contexts and examined it in the context of Web utilization. They included PIIT and CSE but did not include OSL in their research model. This study identified and introduced OSL to the trait hierarchical model of Davis & Yi (2012) and empirically validated the relationships of OSL with IT domain-specific traits (namely, PIIT and CSE), which enriches the research on trait hierarchical model in general and Davis & Yi’s (2012) model in particular. In addition, this study responds to Davis & Yi’s (2012) call for studies identifying and introducing new trait constructs into their trait hierarchical model.

Second, this study draws on and contributes back to OSL theory. Extant studies based on OSL theory were mostly conducted in the marketing and consumer behavior field, and the application of this theory in the IS field is rare. This study contributes to the existing literature by integrating OSL with IS constructs (i.e., PIIT,
CSE, PEOU, and PU). OSL theory has theorized the effects of OSL on individual behaviors, and a significant body of application research, especially in the marketing and consumer behavior domain, has verified the significant impact of OSL on a wide range of individual behaviors (e.g., variety seeking and exploratory behavior). However, the internal, underlying influence mechanism remains unclear. This study found that OSL significantly affects individuals’ PEOU and PU of IT innovations and its effects operate through PIIT and CSE. These results shed light on the influence process of OSL on individual behaviors. In particular, our results offer a plausible explanation for Mittelstaedt et al.’s (1976) study, in which high-OSL individuals were found more likely than low-OSL individuals to adopt innovations. Our findings suggest that such a result may be because high-OSL individuals perceive a higher level of ease of use and usefulness of the innovations than their counterparts.

Furthermore, we leveraged the trait hierarchical model as the theoretical lens to incorporate PIIT and CSE and to explicate the influence mechanism of OSL on PEOU and PU. The significant mediation effects of PIIT and CSE suggest that the trait hierarchical model is an applicable and useful theoretical perspective for OSL researchers interested in uncovering the influence mechanisms of OSL on individual behaviors. Notably, this study echoes the call of Davis & Yi (2012) to relate the trait hierarchical model with IS theories (which, in our case, is TAM) in order to obtain a richer understanding of the role of individual traits in the IT context.

Third, this study contributes to the literature on IT adoption and use by identifying the significant effect of OSL on PEOU and PU. Despite their significance in shaping individual perceptions and behaviors toward IT innovations, personality traits have received limited attention in the IS field (Barnett et al., 2015; Devaraj et al., 2008; McElroy et al., 2007). IS scholars have made strong calls for more research incorporating personality variables to achieve a more comprehensive and deeper understanding of individual perception and behavior in the IT context (Barnett et al., 2015; Devaraj et al., 2008; McElroy et al., 2007). This study responds to such appeals and provides new insights into personality traits that affect individual acceptance and use of IT innovations by validating the influence of OSL on PEOU and PU.

Fourth, to the best of our knowledge, our study is the earliest attempt to systematically examine the interrelationships between PIIT, CSE, and PEOU, which offers a holistic and nuanced understanding of the theoretical relationships of those three constructs. Although PIIT, CSE, and PEOU have been simultaneously included in research models of prior research (Agarwal et al., 2000; Lewis et al., 2003), a holistic and systematic examination of their interrelationships is yet to be done. Agarwal et al. (2000) recognized that PIIT significantly influences CSE, which, in turn, significantly affects PEOU, but they did not examine whether CSE plays a mediator role in the relationship chain. Likewise, Lewis et al. (2003) viewed PIIT and CSE as two parallel antecedents of PEOU and did not test the relationship between PIIT and CSE. This study systematically analyzed the relationships among the three constructs and concluded that CSE plays a mediator role in the influence of PIIT on PEOU. In doing so, this study answered Thatcher and Perrewé’s (2002) call for studies examining whether IT-domain dynamic traits (such as CSE) mediate the effect of PIIT on individual perceptions (such as PEOU).

**Practical Implications**

The findings of this study offer several implications for practice. First, the findings regarding the significant effect of OSL on PEOU and PU highlight the type of individuals who are predisposed to form positive perceptions regarding IT innovation use. Our results showed that high-OSL individuals have a high level of PEOU and PU. Given that PEOU and PU predict individual acceptance and use of IT innovations, our study suggests that companies should give more emphasis to high-OSL individuals when implementing and marketing IT innovations. Companies should create ample opportunities for high-OSL individuals to be aware of, be able to experiment with, and experience IT innovations. For example, to promote high-OSL individuals’ awareness, companies can employ a social media marketing strategy to leverage online social networks’ wide reach and fast information diffusion advantages. They should post their advertisements such as short videos and posters on popular social media platforms. To satisfy high-OSL individuals’ strong desire to approach and explore innovative items, the advertisements must highlight the novelty and innovativeness of products and services. Accordingly, companies can attract high-OSL individuals’ attention and evoke their favorable responses, thereby stimulating their dissemination of the advertisements on social media platforms. To facilitate high-OSL individuals’ experimentation and experience with IT innovations, companies can release trial versions of IT innovations at a low price or for free to mitigate economic barriers to the individuals’ trial of their products and services. Companies can also organize site events to offer them opportunities to explore and experience IT innovations.

Second, our findings on the mediation effects of PIIT and CSE inform companies of effective interventions that can counteract the undesirable effects of OSL on low-OSL individuals’ PEOU and PU. Low-OSL individuals perceive a low level of PEOU and PU, which
creates an impediment to their adoption and use of IT innovations. Our study suggests that companies should perform interventions to increase low-OSL individuals’ CSE to encourage their adoption and use. Toward this end, companies should provide technical support (e.g., user manuals, telephone supporters, and online service representatives) and user training programs to enhance individuals’ self-efficacy about using computer technologies. Through the implementation of interventions, companies can facilitate the formation of low-OSL users’ PEOU and PU and consequently boost their adoption of IT innovations.

Limitations and Future Research

This study has several limitations that should be acknowledged. First, the multi-homing use of SNSs was used as the research context in this study. Although our model strives to be applicable to a wide range of IT innovations, subsequent studies conducted in other IT innovation contexts would be advisable to ascertain the generalizability of our findings. Moreover, differences exist in the adoption of a single vs. same-category multiple IT innovations (Menon & Kahn, 1995). Future research should test our hypotheses with the adoption of a single IT innovation to validate our findings. In addition, the majority of participants adopting multi-homing use of SNSs in our study may generate some bias to our results. We advise future research to collect data in the early stage of IT innovation diffusion to obtain a sample comprising more non-adopters when replicating our study.

Second, the use of a Chinese student sample may limit the generalizability of our findings. Studies (e.g., Bond & Forgas, 1984) suggested that the effects of some personality traits (e.g., conscientiousness) on individuals’ cognitive and decision-making processes differ for individuals with dissimilar cultural backgrounds. Thus, the effects of OSL on individuals’ PEOU and PU are likely to vary across different cultural groups. Moreover, although a meta-analysis of TAM studies (King & He, 2006) suggested that students can be used as surrogates for professionals, caution should be exercised in generalizing the findings of this study to other populations. Future research should expand on our study using a more heterogeneous sample and with different cultures.

Third, this study included only two TAM constructs, PEOU and PU. It did not investigate the influence of OSL on individuals’ behavioral intention and actual behavior. Prior studies have suggested that personality traits not only act as antecedents to individual perceptions but also act as moderators in affecting individual adoption of IT innovations (Devaraj et al., 2008). Future research can incorporate intention and behavior constructs to examine the moderating effect of OSL in individual acceptance and use of IT innovations.

Fourth, aside from the mediation mechanisms theorized in this study, alternative mediating pathways are likely to exist (Hayes, 2013; Rucker, Preacher, Tormala, & Petty, 2011). For instance, according to the trait hierarchical model, hundreds of traits exist at the central and secondary tiers of the hierarchy (Davis & Yi, 2012; Mowen, 2000). Thus, future research can be grounded in the OSL theory to identify other pertinent traits to advance theoretical understanding of the relationships of OSL with other individual traits. In addition, a three-tier hierarchical model was employed in this study. Personality researchers have yet to reach a consensus on the correct number of levels of trait hierarchy (Mowen, 2000; Paunonen, 1998), and multiple models with dissimilar number of levels have been proposed and empirically validated. For example, Mowen’s four-level trait hierarchy has received considerable support in many studies (e.g., Harris & Mowen, 2001; Licata et al., 2003; Mowen, 2004; Mowen & Carlson, 2003). Future research may extend Davis and Yi’s (2012) model by identifying and introducing new levels (if any) to develop a more comprehensive hierarchical model of individual traits in IT contexts. Agarwal et al. (2000) found that the effect of CSE on PEOU of a particular system was partially mediated by individuals’ system-specific self-efficacy; thus it is reasonable to infer that the mediator chain in the OSL-PEOU relation may be extended by including system-specific self-efficacy other than PIIT and CSE. We believe that future research investigating more potential mediators can expand our knowledge of the influence mechanism of OSL on individual perceptions and can thus provide more fruitful suggestions for interventions.

Conclusion

This study employed the trait hierarchical model and drew upon OSL theory and upon the literature on TAM, PIIT, and CSE to examine the impact of OSL on individuals’ PEOU and PU in the context of multi-homing use of SNSs. Analysis of data from 383 SNS users demonstrated that OSL has a significant effect on PEOU and PU, and the effects are mediated by PIIT and CSE. Our findings enrich the understanding on the effects of personality traits in individual acceptance and use of IT innovations. This study also advances OSL theory by investigating the mediation effects of PIIT and CSE on the effect of OSL on PEOU and PU. As OSL is a crucial theoretical construct to IS research, we hope our study encourages further research investigating the effects (e.g., moderating effects) of OSL on individuals’ various responses such as cognition, attitude, and behavior in the IS context.
Two distinct approaches exist regarding the five-factor model (FFM) (Costa & McCrae, 1992; McCrae & Costa, 1990, 1992). The questionnaire approach has been proposed and advocated by McCrae and Costa, and the resulting five-factor personalities (extraversion, agreeableness, conscientiousness, emotional stability, and intellect) are referred to as the Five-Factor Model (FFM) (Costa & McCrae, 1992; McCrae & Costa, 1985; McCrae & Costa, 1987). The Big Five (BF) and FFM share the same label (e.g., extraversion), and the resulting five-factor personalities studied in Devaraj et al. (2008) are the FFM (McCrae & Costa, 1987).

Notes

1. According to these theories, subjective norm (TRA and TPB construct), perceived behavioral control (TPB construct), perceived ease of use and perceived usefulness (TAM constructs), perceived relative advantage, perceived compatibility, perceived complexity, perceived observability, and perceived triability (IDT constructs) are significant determinants of individual acceptance and use of IT innovations.

2. Two distinct approaches exist regarding the five-factor personalities: (1) the lexical approach and (2) the questionnaire approach. As per Block (1995, 2010), the lexical approach has been promulgated largely by Goldberg, and the resulting five-factor personalities (extraversion, agreeableness, conscientiousness, emotional stability, and intellect) are referred to as the Big Five (BF) (Goldberg, 1981, 1990, 1992). The questionnaire approach has been proposed and advocated by McCrae and Costa, and the resulting five-factor personalities (extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience) are referred to as the Five-Factor Model (FFM) (Costa & McCrae, 1992; McCrae & Costa, 1985; McCrae & Costa, 1987).

3. Several scales with different labels have been developed to measure OSL. Among them, the major scales are the Change Seeker Index (CSI) (95 items by Garlington & Shimota (1964)), the short-form CSI (7 items by Steenkamp & Baumgartner (1995)), the Sensation Seeking Scale (SSS) (54-item SSS-I and 34-item SSS-II by Zuckerman et al. (1964); the latest version is the 40-item SSS-V by Zuckerman (1979)), and the Arousal Seeking Tendency (AST) scale (40-item AST-I by Mehrabian & Russell (1973) and 32-item AST-II by Mehrabian (1978)). Despite the different labels, all scales load on the same underlying construct of OSL (McReynolds, 1971; Raju, 1980; Steenkamp, 2010; Steenkamp & Baumgartner, 1992; Wahlers & Etzel, 1985).

4. Note that the hierarchical model was originally depicted as four-tier in Eysenck (1947). However, the present study considers the original model as three-tier because individuals’ specific responses and narrow behaviors are apparently not traits.

5. CSE and computer anxiety are among the most widely studied dynamic IT domain-specific traits (e.g., Davis & Yi, 2012; Thatchter & Perrewé, 2002; Venkatesh & Bala, 2008). They have been theoretically justified and empirically validated as direct antecedents to PEOU but not to PU (Venkatesh & Bala, 2008).

6. The back-translation method was implemented as follows: first, a bilingual native Chinese speaker translated the measures into Chinese. Next, another bilingual native Chinese speaker who had not seen the original measures translated the Chinese version back into English. Then, the original and translated English versions were compared, and no serious discrepancies were found. Through this process, translational equivalence was ensured.

7. Recommended thresholds for the fit indices are as follows: $x^2/df \leq 3:1$ (Hair, Black, Babin, & Anderson, 2014), CFI > 0.90 (Marsh, Hau, & Wen, 2004) or CFI > 0.95 (Hu & Bentler, 1999), TLI > 0.90 (Marsh et al., 2004) or TLI > 0.95 (Hu & Bentler, 1999), RMSEA ≤ 0.08 (Hair et al., 2014), SRMR ≤ 0.08 (Hu & Bentler, 1999).

8. Bootstrapping is a nonparametric resampling method that does not require the stringent assumption of the distribution normality of indirect effects (Hayes, 2013; Preacher & Hayes, 2008; Shrout & Bolger, 2002). It has higher statistical power while maintaining reasonable control over the Type I error rate (Hayes, 2013; MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2008; Shrout & Bolger, 2002). Bootstrapping is a suitable approach for testing complex mediation models (Hayes, 2009; Preacher & Hayes, 2008; Williams & MacKinnon, 2008). More importantly, BC bootstrapping corrects for bias in the central tendency of the indirect effect estimate, thereby yielding a more accurate estimate of confidence intervals (Hayes, 2013; MacKinnon et al., 2004). In fact, Preacher and Hayes (2008) recommend to “use bootstrapping – in particular, BC bootstrapping – whenever possible” (p. 886).

References


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### About the Authors

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