Applying uses and gratifications theory and social influence processes to understand students' pervasive adoption of social networking sites: Perspectives from the Americas

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ABSTRACT

This study provides nascent information on university students' needs to adopt social networking sites (SNSs) pervasively. The study drew from the uses and gratifications theory (UGT) and social influence (SI) processes framework. Relevant hypotheses were formulated to test the proposed research model. Data was collected in a survey of university undergraduates in four countries in the Americas (i.e., United States, Canada, Mexico, and Argentina). Data analysis using partial least squares (PLS) supported 8 out of the 10 hypotheses formulated. The SI process of internalization and identification, as well as UGT categories of self-discovery, entertainment value, social enhancement, and the need to maintain interpersonal connectivity through the construct of behavioral intentions, were found to have positive impacts on students' pervasive adoption of SNSs. The results also revealed that the cultural factor of individualism–collectivism had a positive impact on the pervasive adoption of SNSs, such that greater levels of engagement were observed for students from more individualistic cultures.

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1. Introduction

Social networking sites (SNSs) are web-based services that allow users to connect and interact with one another (Boyd & Ellison, 2008; Chiu, Cheng, Huang, Chen, 2013). Essentially, SNSs enable users to form friendships online and to maintain contacts offline as well (Kavanaugh, Reese, Carroll, & Rosson, 2005; Park, Kee, & Valenzuela 2009; Nadkarni & Hofmann, 2012). Popular SNSs include Facebook, Badoo, Bebo, Friendster, Renren, and LinkedIn. It is worth noting that regional preferences exist in the choice of SNSs. For instance, Badoo is popular in Latin American; Bebo has more users in the United Kingdom (Ku, Chen, & Zhang, 2013), and Renren is popular in China (Bai, Yao, & Dou, 2015). Regardless, the one important fact that remains unchanged across regions of the world is that young adults are engrossed with or pervasively adopt SNSs (DailyMail, 2014; Pempek, Yermolayeva, & Calvert, 2009; Pew Research Center, 2015). Among youth, university students' use of SNSs is reported to be alarmingly high (DailyMail, 2014; Junco, 2012; Pew Research Center, 2015; Raacke & Bonds-Raacke, 2008; Smith & Caruso, 2010). In fact, Smith and Caruso (2010) noted

that about 97% of university students in the United States reported actively using an SNS daily. In 2008, a study by Raacke and Bonds-Raacke reported that university students spent about three hours each day on SNSs. The level of students' SNS use has since shot up astronomically (DailyMail, 2014; Pew Research Center, 2015; Pempek et al., 2009; Ryan, Chester, Reece, & Xenos 2014). For example, a news media outlet in the United Kingdom recently reported that university students in that country spend up to six hours each day on Facebook (DailyMail, 2014). It is possible that higher levels of engagement exist in other parts of the world that have not been reported. It is not surprising that such high levels of student use of SNSs worldwide have become cause for concern (Koc & Gulyagci, 2013; Pempek et al., 2009; Turel & Serenko, 2012).

Recent studies of SNS adoption have discussed the addictive influences of such technologies on youth (Koc & Gulyagci, 2013; Kuss & Griffiths, 2011a, 2011b; Turel & Serenko, 2012; Ryan et al., 2014). The focus of this study is not the addictive effects of SNSs given the established body of work in that area of study. Instead, we are interested in better understanding the factors leading to university students' pervasive adoption of SNSs, with an emphasis on their embedment in, and embracement of, such technologies (Vannoy & Palvia, 2010). To date, several researchers have examined SNS adoption from the perspective of use or usage (characterized by frequency and volume of use), intention to use, and continuance

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usage intentions (Hsu & Wu, 2011; Kang, Min, Kim, & Lee, 2013; Kim, 2011; Ku, Chen et al., 2013; Mäntymäkia & Kai Riemer, 2014; Pinho & Soares, 2011; Sledgianowski & Kulviwat, 2009).

To the best of our knowledge, no prior research has investigated the pervasive adoption of SNSs; thus, this current research will add to existing information about SNS adoption. Of note is the fact that very little research has been conducted about the factors likely to influence students' high engagement with and immersion in SNSs (these terms are akin to the notion of pervasive adoption used herein) (Park et al., 2009; Turel & Serenko, 2012). In this study, pervasive adoption refers to the extent to which users of SNSs willingly accept and make SNSs a central part of their lives (Turel & Serenko, 2012; Vannoy & Palvia, 2010). Knowledge of salient influences on students' pervasive adoption of SNSs will help service providers develop appropriate strategies for this particular segment of the population; others, including university administrators and business operators, can benefit from findings and conclusions on the topic.

Social and individual needs, which vary from one person to another, constitute the main reasons why individuals use SNSs (Kang et al., 2013; Jackson & Wang, 2013; Ryan et al., 2014; Park, 2014). In broad terms, some people use SNSs to enhance personal creativity and visibility, while others use them for self-expression (Boyd & Ellison, 2008; Koc & Gulyagci, 2013; Lin & Lu, 2011; Nadkarni & Hofmann, 2012). Social motives for SNS use include the need to strengthen social ties, collaborate with other SNS members, develop community engagement, and enhance friendships and relationships (Boyd & Ellison, 2008; Kavanaugh et al., 2005; Nadkarni & Hofmann, 2012; Park et al., 2009; Zhong, Hardin, & Sun 2011). To further understanding of the factors likely to impact students' pervasive adoption of SNSs, it is appropriate to begin by recognizing the critical role of individual user needs, gratifications, and social influence in the discourse. Therefore, this study is based on two relevant theoretical underpinnings (i.e., uses and gratifications theory [UGT] and the social influence [SI] processes framework) that emphasize individual needs and gratifications and social imperatives. By considering both individual needs or gratifications and social influence together, we believe that useful information regarding students' pervasive adoption of SNSs will emerge, which each paradigm alone might not readily offer.

Several previous studies have used UGT (Baek, Holton, Harp, & Yaschur, 2011; Cheung, Chiu, & Lee, 2011; Hsu, Tien, Lin, & Chang, 2015; Park et al., 2009; Smock, Ellison, Lampe, & Wohn, 2011; Zolkepli & Kamarulzaman, 2015). In investigating the links between components of UGT and SNSs use, these studies demonstrated support for the applicability of the theory in explaining people's acceptance of SNSs and related platforms (Bagozzi & Dholakia, 2002; Mäntymäkia & Kai Riemer, 2014). Examples of individuals' needs and gratifications commonly cited include information seeking or self-discovery, entertainment or enjoyment, and social enhancement. Knowledge of how such needs impact the pervasive adoption of SNSs is very limited. Given that no prior study has specifically examined the influence of needs and gratifications on students' pervasive adoption of SNSs, we intend to shed light on this aspect. The first research question is as follows:

RQ1: What are students' needs and gratifications in pervasively adopting SNSs?

Researchers have suggested that more useful information will emerge when studies focusing on tools such as SNSs, which are primarily designed to accommodate complex social communication and interaction, take into account the role of SI (Bagozzi & Dholakia, 2002; Cheung & Lee, 2010; Song & Kim, 2006; Vannoy & Palvia, 2010). Studies that used SI processes to investigate the adoption of SNSs revealed that normative influences or norms boded well for individuals' decisions to use such technologies (Cheung & Lee, 2010; Cheung et al., 2011; Li, 2011; Qin, Kim, Hsu, & Tan,

2011). Based on Kelman (1958, 1974), three commonly used SI processes are compliance, internalization, and identification. However, there is a void in the literature regarding how each of the SI processes impact university students' pervasive adoption of SNSs. This paucity of knowledge motivates the second research question, which is as follows:

RQ2: Which social influence processes facilitate students' pervasive adoption of SNSs?

Even though UGT and SI processes are considered pertinent theoretical paradigms that can guide this study, we still accept that richer insight will emerge if the effects of national culture are duly considered. In fact, researchers have shown that national culture is an important factor impacting technology adoption and use (Erunbam & de Jong, 2006; Srite & Karahanna, 2006). National culture is defined as "the collective programming of the mind distinguishing the members of one group or category of people from others" (Hofstede, 2001) and has several dimensions. The cultural dimension of individualism–collectivism (ID–CO), which is more applicable to this study and has been widely used in comparable studies, will be considered. The literature reveals that ID–CO accounts for differences between SNSs users across contexts (Hsu et al., 2015; Jackson & Wang, 2013; Kim, Sohn, & Choi, 2011; Vasalou, Joinson, & Courvoisier, 2010). No prior study has produced information on the impact of ID–CO on university students' pervasive adoption of SNSs. Thus, the third research question, which is designed to help enlighten in this regard, is as follows:

RQ3: What influence do national cultural differences (as indicated by ID–CO) have on university students' pervasive adoption of SNSs?

This study is important for a variety of reasons. First, researchers have fused UGT with other relevant theoretical frameworks, such as innovation/diffusion and critical mass theories (Chiang, 2013; Ku, Chen et al., 2013; Zolkepli & Kamarulzaman, 2015). Mäntymäkia and Kai Riemer (2014) used UGT and SI to study the continued intention to use virtual worlds. However, studies that have combined UGT and SI processes to examine university students' pervasive adoption of SNSs are rare. UGT and SI processes frameworks complement each other given the commonality of socialization factors in both paradigms. Second, this study's dependent construct, pervasive adoption as operationalized by embedment and embracement, has not been widely used in the literature (Vannoy & Palvia, 2010). We add to the frontier of knowledge relating to SNSs adoption by using such variables. Third, the empirical data, which was collected in the Americas, that is, Canada, the United States, and the Latin American countries of Argentina and Mexico, will provide information that has been under-represented in the literature. For example, very few people have studied SNS adoption in Latin America (e.g., Rocha, Jansen, Lofti, & Fraga, 2013). We argue that perspectives from all other parts of the world benefit from knowledge accumulation in the area.

The remainder of the paper proceeds as follows: background literature on SNSs adoption, the notion of pervasive adoption, national culture, and the theoretical underpinnings of the study are presented. The following section presents the research model and hypotheses. Next, the research methodology and data analysis sections are described. Finally, discussions and conclusion of the study's results are presented.

2. Background literature

2.1. Related work on SNSs adoption

Several research studies on SNSs adoption by university students and other segments of the population have been conducted across the world (Chang & Zhu, 2012; Kwon & Wen, 2010; Lin &

Table 1
Information on extensive adoption of Facebook and SNSs in selected countries.

Country	Estimate number of Facebook users for 2012	Estimate population 2012 (Million)	Facebook penetration rate for 2012	Estimate SNS users for 2015 (Million)	Estimate SNS users for 2016 (Million)	Estimate SNS users for 2017 (Million)
Argentina	20,594,680	43,024,374	47.9%	20.8	21.7	22.5
Mexico	40,150,340	120,286,655	33.4%	50	55.3	60.5
Canada	18,090,640	4,834,841	52.7%	18.5	19	19.5
USA	166,029,240	318,892,103	52.9%	157.1	161.4	165.7

Sources: The World Bank (2013); Internetworldstats.com (2013); Statista.com (2015).

Lu, 2011; Pinho & Soares, 2011; Shin & Kim, 2008; Qin et al., 2011). A vast majority of the literature employed usage (characterized by frequency and volume of use), intention to use, and continuance usage intentions as the dependent variables. For example, in their study of university students' acceptance of SNSs, Pinho and Soares (2011) used the technology acceptance model (TAM) (Davis, 1989) as their baseline framework. Their dependent construct, the behavioral intention to use SNSs, was found to be positively impacted by TAM's core constructs: perceived usefulness and ease of use. Sledgianowski and Kulviwat (2009) also utilized TAM, along with trust and normative pressures, to study students' use of SNSs; the variables of TAM were found to be positively linked to SNSs use.

In studying university students' acceptance of SNSs, Qin et al. (2011) found the concept of subjective norm, which is comparable to the SI process of compliance, to be significantly related to usage intentions. Chang, Hung, Cheng, & Wu (2015) also used TAM to investigate factors impacting the intention to continue using SNSs and found support for the hypothesized paths, including perceived usefulness, in their research model. Others (Al-Debei, Al-Lozi, & Papazafeiropoulou, 2013; Chiang, 2013; Chang & Zhu, 2012; Hsu & Wu, 2011; Kim, 2011; Ku, Chen et al., 2013) explored and confirmed the relationships between subjective norm, perceived usefulness and ease of use, and the continued use of SNSs. Although classical individual-based models, including TAM, have furthered understanding of the factors impacting individuals' acceptance of SNSs, the use of such frameworks alone has been criticized because they tend to underemphasize social-based underpinnings that may or may not influence decisions to adopt or reject technologies (Cheung & Lee, 2010; Song & Kim, 2006; Vannoy & Palvia, 2010). More importantly, this study's focus detracts from how people frequently use SNSs (Pempek et al., 2009; Smith & Caruso, 2010) and focuses on how they extensively integrate such technologies into their lives (Turel & Serenko, 2012; Vannoy & Palvia, 2010).

2.2. The notion of pervasive adoption

To gain an understanding of the extensive adoption of SNSs in countries from where data was obtained, we present information about the penetration rates of SNSs (i.e., Facebook). Table 1 summarizes two key pieces of information: (a) Facebook penetration rates, which correspond to the ratio of Facebook users in relation to the total estimated population of each country, expressed as a percentage (The World Bank, 2013; Internetworldstats.com, 2015); and (b) the current estimated number of active SNSs users and projections for the next two years, 2016 and 2017 (Statistca.com, 2015).

It is worth stressing that the word pervasive (i.e., extensive, profound, and prevalent) is used as an adjective to emphasize the depth of adoption among SNS users. Nah, Tan, and The (2004) have similarly used the phrase "symbolic adoption" to describe end-users' mental or cognitive acceptance of new IS in mandatory settings, which they used to distinguish their notion of adoption from the ordinary use of IS. The phrase "pervasive adoption" is not entirely novel as it has been used previously (Santos, 2010); however, its use in the context of SNSs adoption is unknown. Recently, some researchers (Park et al., 2009; Turel & Serenko, 2012) have used

labels such as "immersion" and "high engagement" to describe engrossment with SNSs. We do not perceive pervasive adoption as addiction. Essentially, addiction is pathological and antisocial (Charlton, 2002; Kuss & Griffiths, 2011a; Ryan et al., 2014; Turel & Serenko, 2012). In contrast, we believe that pervasive adoption as we define it, which is also comparable to Turel and Serenko (2012) definition of high engagement with SNSs, can be controlled by users; it is beneficial and does not require medical intervention. To underscore the benefits derived from the pervasive adoption of SNSs, we direct attention to the study by Ellison et al. (2007), who found that university students who used SNSs, particularly Facebook, less frequently felt less satisfied with their lives. They implied that higher levels of engagement in SNSs use could help individuals overcome low satisfaction and self-esteem and enhance social capital. Please also see the work of Valenzuela et al. (2009). Herein, pervasive adoption is associated with a favorable outcome in which an individual user of SNSs cares about the technology and is eager to willingly accept it as an integral part of their lives.

To operationalize pervasive adoption, we used the factors of embracement and embedment, which Vannoy and Palvia (2010) borrowed from past research; they considered these constructs ideally suitable for representing the use of technologies, such as SNSs, that facilitate extensive online social engagement, interaction, and participation. Other researchers, such as Chiu et al. (2013), have used dependent variables such as loyalty to investigate engagement with SNSs. Embracement refers to the degree to which technology is accepted willingly and is viewed in a positive light (Vannoy & Palvia, 2010). Embedment refers to the degree to which messages provided by the technology are understood by the recipient and the degree to which the tool is accepted as an integral part of a user's life (Vannoy & Palvia, 2010).

2.3. Theoretical foundations

2.3.1. Social influence processes

Individuals may adopt a particular technology not because of their own personal persuasions but because of the views of others (Bagozzi & Dholakia, 2002; Cheung & Lee, 2009; Dholakia, Bagozzi, & Pearo, 2004; Malhotra & Galletta, 1999). In general, SI occurs when an individual's opinions or behaviors are affected by others (Aronson, Timothy, & Akert, 2010; Chiu et al., 2013). Each of Kelman (1958, 1974) three broad types of SI processes are described as follows. Compliance is the act of agreeing with others (Kelman, 1958, 1974). Aronson et al. (2010) described compliance as the act of responding favorably to explicit or implicit requests made by others. Identification refers to the process of being influenced by others in the same social group (Cheung et al., 2011; Kelman, 1958, 1974). Internalization refers to the process of accepting a belief or behavior because it is consistent with one's value system (Cheung & Lee, 2010; Kelman, 1958, 1974; Malhotra & Galletta, 1999).

With regard to compliance, an individual may agree with the views of others to accept a particular technology if s/he lacks adequate information on the technology (Cheung et al., 2011). Through the process of identification, individuals accept a particular technology because they want to establish or maintain a satisfying,

self-defining relationship with their social group (Bagozzi & Lee, 2002; Cheung et al., 2011). With regard to the process of internalization, individuals accept a particular technology because it is congruent with their value system (Cheung & Lee, 2010; Malhotra & Galletta, 1999). Results have shown that identification and internalization play critical roles in reinforcing the further use of technologies, such as SNSs (Cheung & Lee, 2010; Cheung et al., 2011; Malhotra & Galletta, 1999).

2.3.2. National culture

Individuals adopt technological innovations or products depending on how they have been preconditioned by their national cultural environments (Erunbam & de Jong, 2006; Srite & Karahanna, 2006). National culture has been researched from a wide range of perspectives. Hofstede (2001) cross-cultural typology, which includes several dimensions, is often cited (Erunbam & de Jong, 2006; Ifinedo, 2009). For the purposes of this study, which deals with a technological tool (i.e., SNSs) used by people in a social context, we believe that Hofstede's cultural dimension of ID–CO is important to include. ID–CO refers to the extent to which a society emphasizes individual or collective (i.e., group) achievements and relationships (Hofstede, 2001). This particular cultural dimension has been used in recent SNS research (Jackson & Wang, 2013; Hsu et al., 2015).

2.3.3. Uses and gratifications theory

UGT is an influential sociological theory or paradigm that explains why and how individuals actively select specific media outlets to satisfy specific needs (Katz, Blumler, & Gurevitch, 1974). UGT assumes that individuals are aware of their needs and are goal-oriented in their use of media; people are capable of assessing value judgments of media content and have the initiative to link needs and gratifications to a specific choice of medium (Katz et al., 1974; West & Turner, 2007). Traditionally, UGT has been used in the context of traditional media, such as newspapers, radio, and television (Luo, Chea, & Chen, 2011; McQuail, 2010; Pai & Arnott, 2013; Tankard Jr. and James, 2000; West & Turner, 2007); however, recent studies have used UGT to study needs and gratifications in the context of computer-mediated communication (CMC) technologies (Cheung & Lee, 2009; Cheung et al., 2011; Dholakia et al., 2004; Ku, Chu, & Tseng, 2013; Luo et al., 2011). According to Ku, Chen et al. (2013, p. 573), "People choose to use a particular CMC technology, instead of other media choices, to communicate with others in order to fulfill their particular gratification needs."

UGT is a useful theoretical framework for studying students' pervasive adoption of SNSs because they are a new CMC tool. The theory suggests that individual users will continue to be engaged with SNSs if their gratifications and needs are fulfilled by such tools (Ku, Chu et al., 2013).

According to the research, categories of uses gratifications include information seeking, enhanced social interaction, entertainment, escapism, and so forth (Katz et al., 1974; McQuail, 2010; Tankard Jr. and James, 2000). Previously, researchers have used factors comparable to the foregoing categories for SNS studies (Cheung et al., 2011; Ku, Chu et al., 2013; Raacke & Bonds-Raacke, 2008; Pai & Arnott, 2013). We will use five categories of UGT (i.e., purposive value, self-discovery, entertainment value, social enhancement, and maintaining interpersonal connectivity) that are similar to the aforementioned gratifications categories. These categories of UGT have been widely adopted for CMC technologies (Cheung & Lee, 2009; Cheung et al., 2011; Pai & Arnott, 2013).

Purposive value refers to values that an individual derives from accomplishing something with a pre-determined informational and instrumental (helpful) purpose (Cheung et al., 2011; Leung & Wei, 2000).

Self-discovery refers to an individual's motivation to understand aspects of one's self through online group participation (Cheung et al., 2011; Raacke & Bonds-Raacke, 2008).

Maintaining interpersonal interconnectivity refers to the social benefits an individual derives from establishing and maintaining contact with other people in an online network (Cheung et al., 2011; Ku, Chen et al., 2013).

Social enhancement refers to values an individual derives from gaining acceptance and the approval of others as well as enhancing his/her social status within the online network (Cheung et al., 2011).

Entertainment value refers to the fun and enjoyment an individual derives from interacting with others in an online network (Ku, Chen et al., 2013; Pai & Arnott, 2013).

3. Research model and hypotheses

The research model, which highlights the components of UGT and SI processes, is presented in Fig. 1. The three modes of SI (i.e., compliance, internalization, and identification) were modeled to impact the behavioral intention to use SNSs, which is directly linked to the dependent variable of pervasive adoption. Behavioral intention was included in the model because the literature shows that SNS researchers often use it as a proximal antecedent to behavior (Hsu et al., 2015; Sledgianowski & Kulviwat, 2009). Pervasive adoption is formed by two first-order constructs: embracement and embedment. The five components of UGT were linked to behavioral intention to use SNSs, as in similar studies (Cheung & Lee, 2009; Cheung et al., 2011; Ku, Chen et al., 2013). The cultural dimension of ID–CO was linked to pervasive adoption to determine the effect of this cultural factor on the dependent construct. Control variables are included to increase insight. As suggested in the literature, age, gender differences, and Internet experience are differentiating factors of SNS usage (Lin & Lu, 2011; McAndrew & Jeong, 2012). Discussions on the research hypotheses are presented next.

When a new CMC emerges, individual users with little or no knowledge of such technology may need to rely on second-hand information from reference groups, such as family or friends, before deciding to adopt that particular technology (Cheung et al., 2011). Ultimately, conformity with the norms of the group is expected with an individual's acceptance of a group's values or behaviors (Aronson et al., 2010; Cheung & Lee, 2010). SNS research suggests that Facebook is an environment in which conformity is expected (Egebark & Ekstrom, 2011; Vasalou et al., 2010). Past studies that used student populations confirmed that normative influences related to compliance are positively related to behavioral intentions to use SNSs (Al-Debei et al., 2013; Ku, Chen et al., 2013; Sledgianowski & Kulviwat, 2009). In line with the foregoing information, we expect that students' behavioral intentions to use SNSs will be positively impacted by compliance. That is, students' intentions to use SNSs will be favorable where agreement with the views of others in their network has been established. Therefore, we hypothesized that:

H1: Compliance has a positive impact on students' behavioral intention to use SNSs.

Kelman (1958, 1974) suggested that individuals may be influenced by their social group's views if actions or behaviors sanctioned by the group are congruent with their personal value system and/or are intrinsically rewarding to them. Regarding SNS use, the opinions of others matter as much as one's own opinion (Li, 2011; Cheung et al., 2011; Qin et al., 2011). With regard to the process of internalization in virtual communities, it was demonstrated that when individuals realize that other members of the network share common values or goals, they tend to form favorable intentions to participate in their social group's activi-
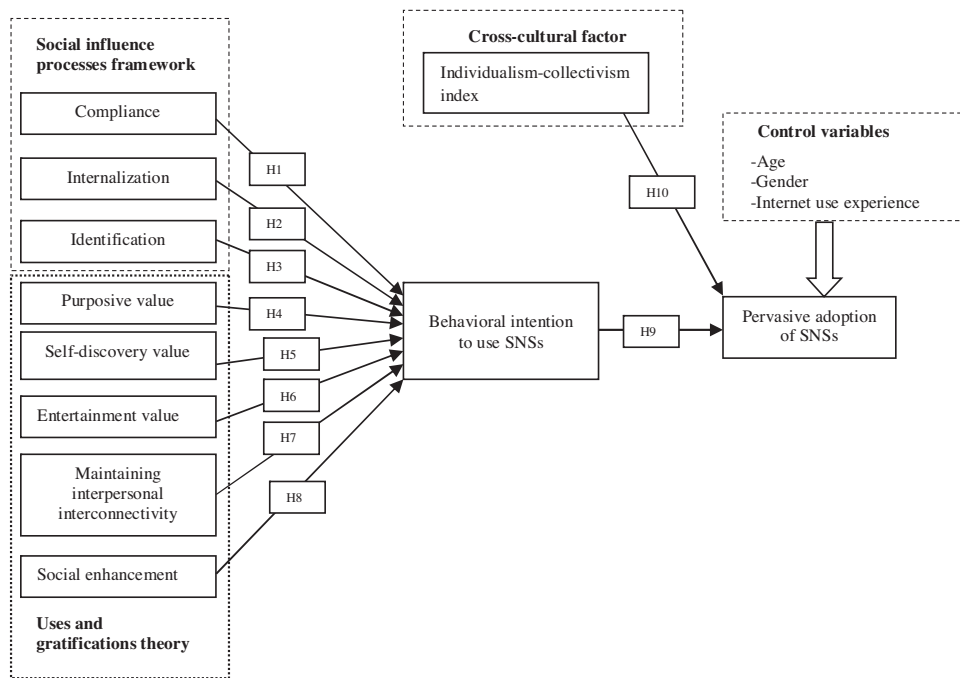
Fig. 1. The research model and hypotheses.

ties (Bagozzi & Dholakia, 2002; Cheung et al., 2011; Malhotra & Galletta, 1999). Studies also found that students' internalization process with regard to SNS use has positive effects on their intentions to use such tools (Cheung et al., 2011; Li, 2011). Therefore, we hypothesized that:

H2: Internalization has a positive impact on students' behavioral intention to use SNSs.

As previously indicated, the identification process is important for reinforcing group norms and values (Bagozzi & Dholakia, 2002; Kelman, 1958, 1974). For instance, an individual user may accept a technological tool such as an SNS because they want to establish or maintain a satisfying, self-defining relationship with their reference or social group (Cheung & Lee, 2009; Cheung et al., 2011; Li, 2011). Thus, we expect that an individual SNS user that has "identified" with the norms of their reference or social group will have favorable intentions regarding such tools. Previously, researchers (Cheung & Lee, 2010; Cheung et al., 2011; Chiu et al., 2013; Li, 2011) have confirmed that a positive relationship exists between the SI process of identification and intentions to use SNSs. Therefore, we hypothesized that:

H3: Identification has a positive impact on students' behavioral intention to use SNSs.

Users adopt SNSs for a wide range of purposes (Guo, Shim, & Otondo, 2010; Leung & Wei, 2000; Park et al., 2009; Raacke & Bonds-Raacke, 2008; Ryan et al., 2014; Smock et al., 2011). For example, students use SNSs to receive information about events on and off campus (Park et al., 2009; Raacke & Bonds-Raacke, 2008). Some obtain status updates from SNSs (Smock et al., 2011) and others simply pass time using such tools (Hunt, Atkin, & Krishnan, 2012; Sheldon, 2008; Special & Li-Barber, 2012). The need to discover one's self through participation in online groups is another gratification often derived by SNS users (Cheung et al., 2011; Guo, Shim, & Otondo, 2010; Hunt et al., 2012; Park et al., 2009; Pai & Arnott, 2013; Raacke & Bonds-Raacke, 2008; Shoenberger & Tandoc, Jr., 2014). The foregoing insights permit us to postulate that students' intentions to use SNSs will be positively impacted by the purposive value they have for such tools and their self-discovery needs or motives. Therefore, we hypothesized that:

H4: Purposive value has a positive impact on students' behavioral intention to use SNSs.

H5: Self-discovery value has a positive impact on students' behavioral intention to use SNSs.

Perhaps one of the paramount reasons why people use SNSs is to be entertained (Hunt et al., 2012; Hsu et al., 2015; Jackson & Wang, 2013; Park et al., 2009; Ryan et al., 2014; Sheldon, 2008; Special & Li-Barber, 2012; Zolkepli & Kamarulzaman, 2015). If users find SNSs to be boring, they will probably not actively participate in the use of such tools. Evidence points to the fact that people enjoy using SNSs; this fact might help explain the extensive global acceptance of such technologies among youth and other groups (Internetworldstats.com, 2015; Junco, 2012; Pew Research Center, 2015; Raacke & Bonds-Raacke, 2008; Ryan et al., 2014; Smith & Caruso, 2010; Statistca.com, 2015). Researchers such as Cheung et al. (2011), Hsu et al. (2015), Ku, Chen et al. (2013), Ku, Chu et al. (2013), Lin and Lu (2011), and Wu et al. (2010) have found the entertainment value of SNSs to be a strong determinant of usage intentions among students. Therefore, we hypothesized that:

H6: Entertainment value has a positive impact on students' behavioral intention to use SNSs.

Research has consistently shown that socializing needs, including maintaining interpersonal interconnectivity and social enhancement, are important gratifications derived from SNS use (Cheung et al., 2011; Guo, Shim, & Otondo, 2010; Hsu et al., 2015; Ku, Chen et al., 2013; Park et al., 2009; Raacke & Bonds-Raacke, 2008; Sheldon, 2008; Special & Li-Barber, 2012; Wu, Wang, & Tsai, 2010; Zolkepli & Kamarulzaman, 2015). That is, the desire to connect with others and enhance one's own social worth motivates online network engagement. The studies by Ryan et al. (2014) and Smock et al. (2011) revealed that interpersonal interconnectivity or relationship maintenance and social enhancement are among the key reasons why people have intentions to engage in SNS use. Thus, we contend that students' intentions to use SNSs will be positively associated with both social needs and motives. Therefore, we hypothesized that:

H7: The need to maintain interpersonal interconnectivity has a positive impact on students' behavioral intention to use SNSs.

H8: The need for social enhancement has a positive impact on students' behavioral intention to use SNSs.

Prior research has consistently confirmed a positive link between the intention to engage in a specific behavior and actual behavior (Sheeran, 2002). Similar findings have been reported in studies investigating the relationship between behavioral intentions to use SNSs and actual usage behaviors (Al-Debei, Al-Lozi, & Papazafeiropoulou, 2013; Sledgianowski & Kulviwat, 2009). For this reason, we predict that students with favorable intentions to use SNSs will have a higher propensity to pervasively adopt SNSs and reap the social benefits associated with such tools. Conversely, those with less favorable intentions to use SNSs will not actively engage in the use of such tools and derive little or no social gains from such tools (Ellison, Steinfield, & Lampe, 2007; Valenzuela et al., 2009). Therefore, we hypothesized that:

H9: The behavioral intention to use SNSs has a positive impact on students' pervasive adoption of SNSs.

People from individualistic cultures are driven by personal motivation and choices, whereas those from collectivist cultures are governed by group values and norms (Hofstede, 2001). The literature shows that technology adoption tends to be greater in individualistic cultures than in collectivist contexts, perhaps due to the critical role that personal motivation and choice plays in the individual decision to accept IS (Erunbam & de Jong, 2006; Hofstede, 2001; Srite & Karahanna, 2006). Researchers have also found significant relationships between national cultural values and SNS adoption (Hsu et al., 2015; Jackson & Wang, 2013; Kim et al., 2011; Vasalou et al., 2010). For example, Jackson and Wang (2013) found that personal characteristics were stronger predictors of SNS engagement for users in a more individualistic culture (the United States) than for users in a collectivist culture (China). Hsu et al. (2015) collected data from 493 active users of Facebook in five countries (i.e., Australia, Austria, Japan, Taiwan, and the United States) to show that there are differences between SNS users in individualistic and collectivist cultures in terms of variables such as information seeking behaviors and socialization. Chau et al. (2002) found that people in individualistic cultures, perhaps due to a greater level of self-awareness, tend to use social media to obtain information compared to people in collectivist cultures. We posit that ID–CO will have a similar effect on students' pervasive adoption of SNSs such that greater levels of engagement with such tools will be noticeable in individualistic cultures compared to collectivist contexts. Therefore, we hypothesized that:

H10: The cultural dimension of ID–CO has a positive impact on students' pervasive adoption of SNSs, such that the effect is greater in individualistic cultures.

4. Research methodology

4.1. Measurement development

Measurement items used for the study were taken from previously validated studies. The scales used to operationalize compliance, internalization, identification, purposive value, self-discovery, entertainment value, social enhancement, and maintaining interpersonal connectivity were adapted mainly from Cheung et al. (2011) and Dholakia et al. (2004). The behavioral intention to use SNSs scale was modified from Cheung and Lee (2009). The scales for embracement and embedment were self-developed following DeVellis (1991), Straub (1989), and Iacobucci and Churchill, 2009 multi-phase process of instrument refinement and validation. The phases involved in the development of these scales included a literature search, discussions with professors and students, pre-testing of the sampling frame, a pilot test, data analysis (i.e., exploratory factor analysis), and nomological valid-

ity assessment. Appendix A₁ and A₂ succinctly describe each of the phases.

Cultural dimension scores for each country came from Hofstede (2001). Specifically, Hofstede scored Canada, the United States, Mexico, and Argentina at 80, 91, 30, and 46, respectively on the ID–CO index. Nations with higher scores on the index (i.e., Canada and the United States) are individualistic countries and those with lower scores are collectivist (i.e., Mexico and Argentina). The four countries in the Americas were chosen for illustration purposes and because we have contacts there. Items used to operationalize all constructs were anchored on a 7-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (7), and participants were asked to give the most appropriate response. The measurement items and their descriptive statistics are provided in Appendix B.

4.2. Data collection procedure

Hypotheses were tested using data collected in a survey administered in the chosen countries. The choice to use more than one country permits the assessment of influences arising from national culture. A convenience sample of university students who use SNSs was considered adequate for the study. Contacts, including professors in the chosen countries, were tasked to collect data from students who actively use at least one SNS tool. A data sample size ranging from 150 to 220 responses per country was considered sufficient for the study, which is exploratory in nature (Malhotra, 2009).

A pre-test of an initial draft of the questionnaire and a pilot test were conducted. The comments and feedback we received during these phases helped us improve the quality of the final questionnaire. A paper-based questionnaire was administered in person in each country. The questionnaire for the main study contained items dealing with the use of SNSs (i.e., Facebook, Badoo). For participants in Mexico and Argentina, we translated the questionnaire into the versions of Spanish spoken in each country. The questionnaire in English was translated by bilingual translators following the back-translation method suggested by Brislin (1986). The translations suggest the items on the questionnaire instrument were expressed in the same way in both English and Spanish. Data was collected from more than one source or location in each of the countries (Appendix C). Although the data for each country came from different locations, chi square (χ^2) tests to compare sub-samples for each country did not show significant differences among the sources.

4.3. Participants

Responses were solicited from students across various disciplines. Students were motivated by the fact that their candid responses on the use of SNSs were part of an international study. Participation in the study was voluntary, and respondents were assured that their responses would be anonymous. The researchers promised to share the summarized data with the students. On average, the response rate for each country was about 91%, which is considered high (Malhotra, 2009). Questionnaires with too much missing data and poorly completed ones were removed from the sample. Thus, 201, 205, 163, and 228 usable questionnaire responses collected from students in Canada, the United States, Argentina, and Mexico, respectively, were used for data analysis. A total of 797 questionnaires were collected. This is sufficient for an exploratory study such as this one (Hair, Anderson, Thatham, & Black, 1998). Demographic information regarding the participants' gender, age, program of study, year of study, and Internet use experience are presented in Table 2.

Table 2
Demographic characteristics of the sample (*N* = 797).

Variable	Argentina *N* = 163	Canada *N* = 201	USA *N* = 205	Mexico *N* = 228	Total *N* = 797	Percent (%) (Total)
Gender						
Female	44	95	90	119	348	43.7
Male	119	105	112	109	445	55.8
Missing		1	3		4	0.5
Age range						
Less than 18yrs	4	64	3	1	72	9.0
19–21 yrs	28	112	74	83	297	37.3
22–24 yrs	33	16	67	80	196	24.6
25–27 yrs	46	6	20	19	91	11.4
Above 27 yrs	52	3	41	45	141	17.7
Missing						
Academic program (Discipline)						
Sciences and Engineering	144	59	34	81	318	39.9
Social sciences, Humanities, and Arts	18	142	169	143	472	59.2
Missing	1		2	4	7	0.9
Year of study						
First	74	39	3	2	118	14.8
Second	27	60	9	30	126	15.8
Third	11	59	82	69	221	27.7
Fourth	19	33	85	96	233	29.2
Fifth	27	8	26	30	91	11.4
Missing	5	2		1	8	1.0
Internet use experience						
One year or less	6	7	1	2	16	2.0
2 to 4 years	14	80	3	13	110	13.8
5 to 7 years	33	27	40	58	158	19.8
8 to 10 years	48	28	63	70	209	26.2
10 years and above	62	58	96	84	300	37.6
Missing		1	2	1	4	.5

4.4. Common method variance

As we collected both independent and dependent data from the same source, common method variance (CMV) cannot be ruled out (Chang, van Witteloostuijn, & Eden, 2010). CMV refers to systematic measure errors that arise in data collection when a single respondent provide both independent and dependent variables. The existence of such errors might lead to either over- or under-estimation of the relationships between independent and dependent variables to create a bias in the interpretation of results (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Several methods exist to test for CMV; we applied the widely used procedure recommended by (Podsakoff et al., 2003). Namely, the Harman's single factor test was used to assess if CMV was problematic to the data. The assumption of this test is that CMV exists if all indicators fall under a single construct or if the first construct explains most of the variance in the data. The test results (i.e., factor loadings) indicated that the first factor accounted for 40.2%, and several factors with eigenvalues greater than one are present in the data to eliminate CMV problems for the data.

5. Data analysis

The partial least squares (PLS) technique (Chin, 1998; Hair, Ringle, & Sarstedt, 2011; Kock, 2015; Tenenhaus, Vinzi, Chatelin, & Lauro, 2005), which employs a component-based estimation for maximizing the variance explained in the dependent variable was used to test the developed hypotheses. PLS is similar to regression analysis; however, it permits the utilization of latent constructs (Henseler, Ringle, & Sinkovics, 2009; Wetzels, Odekerken-Schroder, & van Oppen, 2009). PLS places minimal restrictions on sample sizes and residual distributions; it is ideal for exploratory studies and theory development, and it supports both formative and reflective constructs (Chin, 1989; Hair et al., 2011; Henseler et al., 2009). Given the exploratory nature of our study, PLS seemed an appro-

priate analysis to use. We used WarpPLS 5.0 software to conduct PLS analysis. Following Anderson and Gerbing (1988) guidelines, we used the two-step approach of assessing the measurement and structural models.

5.1. Measurement model

The research model consisted of reflective and formative constructs. It is recommended that information about the reflective construct be presented first, followed by information about the formative construct (Wetzels et al., 2009). For the reflective construct, internal consistency and convergent and discriminant validity tests were carried out to test the psychometric properties of the measures used to represent them (Chin, 1998; Hair et al., 2011). Two tests commonly used to evaluate the internal consistency of measures are composite reliability (COM) and Cronbach's alpha (CRA); values higher than 0.7 are considered adequate for these tests (Fornell & Larcker, 1981; Hair et al., 2011). Table 3 shows that CRA and COM are consistently above the threshold value of 0.70, suggesting the items used in the study have internal consistency.

Convergent and discriminant validities are assessed as follows: (a) standardized items should load much higher on their hypothesized construct than on other constructs in the model (Chin, 1998); (b) standardized item loadings should exceed 0.707 (Fornell & Larcker, 1981); however, values of 0.6 are considered adequate for exploratory studies (Hair et al., 1998); (c) average variance extracted (AVE) for each reflective construct should be above the cutoff value of 0.50 (Chin, 1998; Fornell & Larcker, 1981); (d) the square root of AVE for each construct should be larger than the correlations between that construct and all other constructs (Fornell & Larcker, 1981; Hair et al., 2011). As shown in Appendix C, standardized items load much higher on their respective constructs than on any other constructs, and are consistently above the threshold value of 0.707 to suggest convergent validity. AVE ranged from 0.53 to 0.89, and in no case was any correlation between the constructs

Table 3
Composite reliabilities, Cronbach alphas, latent variable correlations with AVE on diagonal.

	COM	CRA	AVE	IDN	INL	CMT	PUV	ENT	SOE	SDV	MIC	BEH	IN-CO	PAD
IDN	0.892	0.818	0.734	**0.857**	0.705	0.622	0.482	0.482	0.45	0.471	0.53	0.381	0.001	0.588
INL	0.890	0.815	0.731	0.705	**0.855**	0.611	0.579	0.505	0.439	0.51	0.569	0.467	0.002	0.585
CMT	0.767	0.644	0.525	0.622	0.611	**0.725**	0.529	0.492	0.483	0.488	0.504	0.419	0.013	0.539
PUV	0.907	0.863	0.709	0.482	0.579	0.529	**0.842**	0.396	0.448	0.516	0.471	0.363	-0.046	0.391
ENT	0.935	0.906	0.782	0.482	0.505	0.492	0.396	**0.884**	0.453	0.619	0.691	0.684	0.03	0.608
SOE	0.832	0.693	0.627	0.45	0.439	0.483	0.448	0.453	**0.792**	0.485	0.4	0.326	0.168	0.479
SDV	0.785	0.701	0.557	0.471	0.51	0.488	0.516	0.619	0.485	**0.746**	0.745	0.587	0.013	0.51
MIC	0.856	0.747	0.665	0.53	0.569	0.504	0.471	0.691	0.4	0.745	**0.815**	0.692	0.019	0.572
BEH	0.958	0.935	0885	0.381	0.467	0.419	0.363	0.684	0.326	0.587	0.692	**0.941**	0.063	0.587
IN-CO	na	na	na	0.001	0.002	0.013	−0.046	0.03	0.168	0.013	0.019	0.063	**1.00**	0.059
PAD	0.911	0.804	0.836	0.588	0.585	0.539	0.391	0.608	0.479	0.51	0.572	0.587	0.059	**0.914**

Notes: (a) Composite reliability (COM), Cronbach alpha (CRA), average valance extracted (AVE).
(b) The bold fonts in the leading diagonals are the square root of AVEs.
(c) Off-diagonal elements are correlations among latent constructs.
(d) na = Not applicable; SDV = Self-discovery value; PUV = Purposive value; ENT = Entertainment value; MIC = Maintaining interpersonal interconnectivity; SOE = Social enhancement value; IDN = Identification; INL = Internalization; CMT = Compliance; ID–CO = Individualism–collectivism index; BEH = Behavioral intention to use SNS; PAD = Pervasive adoption of SNS.

greater than the squared root of AVE (the principal diagonal element) (Table 3). These results demonstrate that the psychometric properties of the measures used for the reflective construct have discriminant validity as well.

Regarding the formative construct, the pervasive adoption of SNSs, we followed the guidelines proposed in the literature (Petter, Straub, & Rai, 2007). The main recommendation is that the significance of the item weights and multicollinearity among the indicators used to form the formative construct be assessed. First, the results showed that the weights of the items used for the dependent construct have significant values. Second, the items' variance inflation factor (VIF) indicators, which provide information on multicollinearity, were consistently below the value of 1.5 (Table 4). Petter et al. (2007) recommended a threshold value of 3.3 for this assessment, and Kock (2015) noted that path significance (*P*) values <0.05 and VIFs <2.5 are desirable for formative indicators. The items used to represent the formative construct of pervasive adoption are satisfactory as their quality criteria were adequate.

5.2. Structural model

PLS results from WarpPLS 5.0 provide information about path significance (*P*), beta (β) coefficients, predictive relevance (Q^2), Goodness of Fit (*GoF*), and the coefficient of determination (R^2) for the amount of variance explained for the structural model.

Q^2 represents a synthesis of function fitting and cross-validation that determines the capacity of the model to predict (Geisser, 1975; Kock, 2015; Stone, 1974). Q^2 values greater than zero indicate that the observed values are appropriately reconstructed and have predictive relevance; by the same token, values below zero signify a lack of predictive relevance. The WarpPLS 5.0 results are as follows: Q^2 of all the antecedents on behavioral intention to use SNS is 0.60 and the effect of this construct and the control variables on pervasive adoption of SNS is 0.35. These results show that the research model has adequate predictive validity.

GoF is a global fit measure that accounts for both measurement and structural model performance (Hair et al., 2011; Tenenhaus et al., 2005; Wetzels et al., 2009). Wetzels et al. (2009) proposed the following *GoF* thresholds: small if equal to or greater than 0.1, medium if equal to or greater than 0.25, and large if equal to or greater than 0.36. The study's *GoF* has a value of 0.66, which is larger than the cutoff value of 0.36 for large effect sizes.

Regarding the amount of variance explained, i.e., R^2, the independent variables (i.e., UGT categories and SI processes) explained 0.78% of the variance in the behavioral intention to use SNS. ID–CO, the behavioral intention to use SNS, and the control variables

explained 0.37% of the variance in pervasive adoption of SNS. Chin (1998) indicated that R^2 values of 0.67, 0.33, and 0.19 as percentages of variance in a model are substantial, moderate and weak, respectively. Information on the model's Ps and βs is presented in Fig. 2.

Eight out of the 10 formulated hypotheses were supported. The data did not support H1 ($\beta = 0.05$, $P = 0.08$), which was formulated to assess the impact of the SI process of compliance on students' behavioral intention to use SNSs. H2, which predicted that internalization would have a positive impact on students' behavioral intention to use SNSs was confirmed ($\beta = 0.11$, $P < 0.001$). The data supported H3 to affirm that the SI process of identification positively impacts students' behavioral intention to use SNSs ($\beta = 0.09$, $P < 0.001$). The supported results for H2 and H3 provide answers to RQ2.

H4, which states that purposive value would positively impact students' behavioral intention to use SNSs, was not confirmed by the data ($\beta = 0.04$, $P = 0.11$). The data did support H5, which states that the prediction indicating that self-discovery would has a positive impact on students' behavioral intention to use SNSs ($\beta = 0.10$, $P < 0.001$). The data strongly supported H6 to show that entertainment value has a positive effect on students' behavioral intention to use SNSs ($\beta = 0.39$, $P < 0.001$). Likewise, H7, which states that the need to maintain interpersonal interconnectivity has a positive impact on students' behavioral intention to use SNSs, was upheld ($\beta = 0.38$, $P < 0.001$). H8 was supported to show that social enhancement positively impacts students' behavioral intention to use SNSs ($\beta = 0.08$, $P < 0.001$). The supported results for H5, H6, H7, and H8 provide answers to RQ1.

The data supported H9 to confirm that behavioral intention has a positive impact on students' pervasive adoption of SNSs ($\beta = 0.58$, $P < 0.001$). H10 was also supported to show that the cultural dimension of ID–CO has a positive effect on students' pervasive adoption of SNSs and the impact was higher for students in individualistic cultures ($\beta = 0.09$, $P < 0.001$). The result for H10 provides an answer to RQ3. None of the control variables had significant effects on pervasive SNS adoption. Table 5 summarizes the results.

6. Discussions

This study seeks to add to the understanding of factors influencing students' pervasive adoption of SNSs. Uses and gratifications, and social influence processes paradigms were used to guide the discourse. The results show that significant amounts of variance in the constructs of behavioral intention to use SNSs and pervasive adoption of SNSs were explained by the model's independent vari-

Table 4
Quality criteria for the formative construct.

Item #	Measuring item	Mean	SD	P values	VIF	IES
Embracement 1	I foresee no difficulty in embracing, i.e., adopting willingly SNSs (e.g., Facebook) use.	5.14	1.69	<0.001	2.849	0.087
Embracement 2	My group of friends using SNSs sees no difficulty in embracing, i.e., adopting willingly this social tool.	5.40	1.47	<0.001	2.923	0.091
Embracement 3	Adopting SNSs willingly or eagerly is important to me.	4.07	1.78	<0.001	3.585	0.148
Embracement 4	Adopting SNSs willingly or eagerly is important to my group of friends.	4.49	1.67	<0.001	3.283	0.144
Embedment1	I accept that SNSs (e.g., Facebook) is an integral part of my social life.	4.16	1.82	<0.001	3.429	0.147
Embedment2	My group of friends accepts that SNSs is an integral part of our social lives.	4.58	1.64	<0.001	3.091	0.132

Note: VIF = indicator variance inflation factor; IES = indicator effect size; SD = Standard deviation.

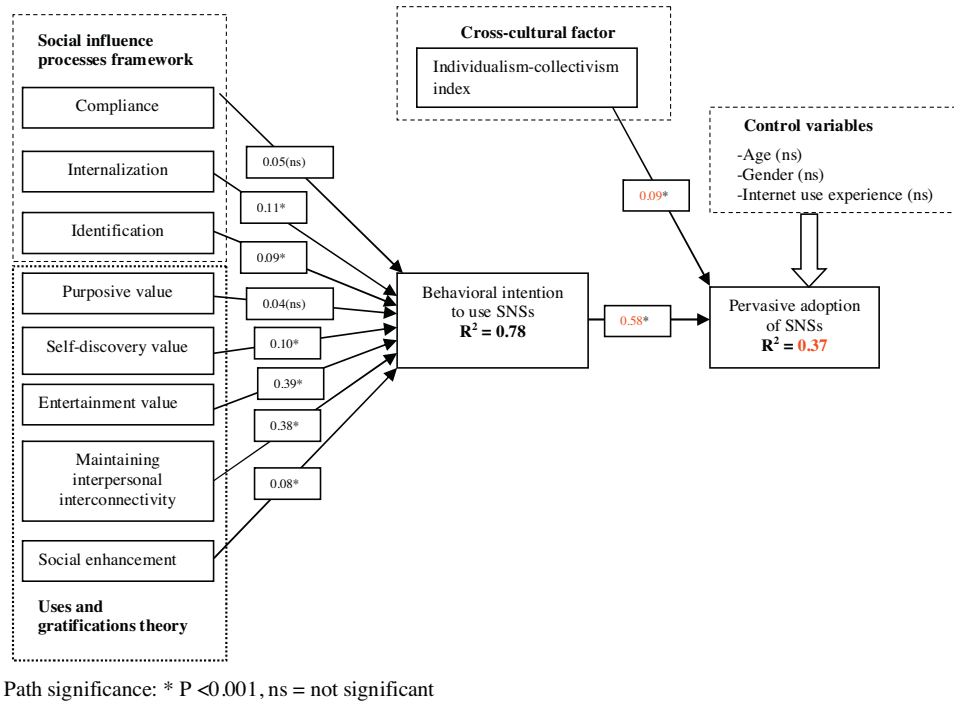Path significance: * P <0.001, ns = not significant

Fig. 2. Results for the proposed research model.

Table 5
Results for statistical support of the study's hypotheses.

Hypothesis	β	p-Value	Result
Compliance → behavioral intention to use SNSs	0.05(ns)	0.08	H1: not supported
Internalization → behavioral intention to use SNSs	0.11*	<0.01	H2: supported
Identification → behavioral intention to use SNSs	0.09*	<0.01	H3: supported
Purposive value → behavioral intention to use SNSs	0.04(ns)	0.11	H4: not supported
Self-discovery value → behavioral intention to use SNSs	0.10*	<0.01	H5: supported
Entertainment value → behavioral intention to use SNSs	0.39*	<0.01	H6: supported
Maintaining interpersonal interconnectivity → behavioral intention to use SNSs	0.38*	<0.01	H7: supported
Social enhancement → behavioral intention to use SNSs	0.08*	<0.01	H8: supported
Behavioral intention to use SNS → pervasive adoption of SNSs	0.58*	<0.01	H9: supported
Individualism–collectivism index → pervasive adoption of SNSs	0.09*	<0.01	H10: supported

Note: significance: *$p < 0.001$, ns = not significant.

ables to demonstrate the relevance of the proposed research model (Chin, 1998).

Contrary to the stated prediction in H1, the data indicated that the SI process of compliance has an insignificant impact on students' behavioral intention to use SNSs. This result is somewhat surprising because conformity with group values, at least, in relation to expected rewards for compliance and punishment for noncompliance, are among the main reasons why individuals comply with group norms (Aronson et al., 2010; Kelman, 1958). For example, it would be worthwhile to know if a student who fails to accept SNS or uses the tool differently from peers would be accepted by others. SNS researchers (e.g., Cheung & Lee, 2010;

Cheung et al., 2011; Chang et al., 2015) who reported a similar result as the one discussed herein suggested that students who are already adept SNSs users do not need the recommendations or approval of others to accept such technologies. More empirical studies are needed to increase knowledge of the relationship between compliance and behavioral intention to use such SNSs.

The results indicated that university students show willingness to use SNSs when they know that others in their social network group have the same values regarding the benefits of such tools and similar needs to establish or maintain satisfying relationships with others in their network. As H2 and H3 are supported, the impacts of the SI processes of internalization and identification – socialization

with peers after joining SNSs – appear to be compelling drivers of students' intentions to use SNSs, more so than recommendations from others about such tools. The results in these aspects are in agreement with findings in studies affirming that internalization and identification processes with respect to SNSs use have positive impacts on students' intentions to use such tools (Cheung & Lee, 2010; Cheung et al., 2011; Chiu et al., 2013; Li, 2011).

It is somewhat surprising that the data did not affirm the relationship between purposive value and students' behavioral intention to use SNSs (H4). This result may be due to the fact that students and others have a wide range of reasons for joining SNSs (Leung & Wei, 2000; Park et al., 2009; Raacke & Bonds-Raacke, 2008; Ryan et al., 2014; Smock et al., 2011) and this study's questionnaire might not have adequately captured the varied reasons why each person actively accepts or engages in the use of SNSs. That being noted, the study by Cheung et al. (2011) that used the same measuring items for purposive value as this study also failed to confirm a meaningful relationship between purposive value and students' intentions to use SNSs. However, more refinement may be needed to increase knowledge in this aspect.

The results provided strong statistical support for H5–H7 to show that the UGT components of self-discovery value, entertainment value, maintaining interpersonal interconnectivity, and social enhancement have positive impacts on students' behavioral intentions to use SNSs. With respect to each hypothesis, we offer the following insights. The results suggested that students use SNS because of the need to learn more about themselves and others, i.e., for self-discovery; thus, this finding corroborates observations in past SNSs studies (Chang et al., 2015; Hunt et al., 2012; Lin & Lu, 2011; Pai & Arnott, 2013; Park et al., 2009; Raacke & Bonds-Raacke, 2008). The need for entertainment and maintaining interpersonal interconnectivity with others yielded the largest statistical impact on students' intentions to use SNSs in this study. This indicates that such tools are largely considered pleasure-oriented platforms through which enjoyment and pleasure can be obtained, and connections with others facilitated. The results are congruent with findings in other studies (Chang et al., 2015; Cheung et al., 2011; Ku, Chen et al., 2013; Hsu et al., 2015; Lin & Lu, 2011; Special & Li-Barber, 2012; Wu et al., 2010; Zolkepli & Kamarulzaman, 2015).

The results emphasized the importance of social enhancement needs as a major determinant of students' intentions to use SNSs (H8); thus, this finding is in agreement with espoused insights in Cheung et al. (2011), Hsu et al. (2015) Ryan et al. (2014), Special and Li-Barber (2012), Wu et al. (2010) and Zolkepli and Kamarulzaman (2015). We found evidence that behavioral intentions to use SNSs strongly impacted students' pervasive adoption of SNSs (H9). This is consistent with prior research findings that reported the existence of a strong link between intentions to use SNSs and usage behaviors (Al-Debei, Al-Lozi, & Papazafeiropoulou, 2013; Sledgianowski & Kulviwat, 2009).

Regarding H10, the results revealed that dimensions of ID–CO positively impact students' pervasive adoption of SNSs and the impact is greater in individualistic cultures. That is, students from individualistic contexts are more likely to embed themselves in, and embrace SNSs more than counterparts in collectivist cultures. This is in line with evidence indicating that SNSs users in individualistic countries engage more in the use of such tools for their personal and social needs than people from collectivist cultures (Chau, Cole, Massey, Montoya-Weiss, & O'Keefe, 2002; Kim et al., 2011; Jackson & Wang, 2013; Hsu et al., 2015; Vasalou et al., 2010). As previously indicated, data shows that SNSs penetration rates are indeed higher in individualistic countries compared to those reported for collectivist countries (Chau et al., 2002; Hsu et al., 2015; Jackson & Wang, 2013). This study is not discounting the influence of other socio-economic factors in the adoption process

of SNSs (Hsu et al., 2015); however, such concerns were not considered in this study.

6.1. Theoretical contributions

This study contributes to the literature in several ways. A combination of UGT and SI processes framework were applied to study students' pervasive adoption of SNSs. No prior research has used both theoretical frameworks to investigate students' pervasive adoption of SNS. To that end, the results provide further evidence of the applicability and suitability of UGT and SI processes for understanding the phenomenon of SNSs adoption, in general, and SNSs pervasive adoption, in particular. Based on this study's results, elements from both theoretical paradigms provide useful insights into the phenomenon. This study showed that the SI processes of internalization and identification strongly influenced students' pervasive adoption of SNSs through behavioral intentions, but compliance did not. It is revealed that uses gratifications related to self-discovery, entertainment value, social enhancement, and maintaining interpersonal connectivity positively impacted students' pervasive adoption of SNSs; purposive value did not. Other researchers can use or expand UGT and SI processes paradigms to examine students' high engagement or engrossment with SNSs and related social tools. This current endeavor could be built upon to increase insight in the area. Support is provided to the view indicating that identification and internalization play crucial roles in reinforcing the further use of collaborative technologies such as SNSs (Cheung & Lee, 2010; Cheung et al., 2011; Malhotra & Galletta, 1999).

This study demonstrated that students' pervasive adoption of SNSs vary by cultural dimension of ID–CO. Other researchers may further deepen insight in this area to grow the body of work relating national culture to SNSs use and adoption (Chau et al., 2002; Jackson & Wang, 2013; Kim et al., 2011; Vasalou et al., 2010). Another contribution made by this study is that it used empirical data from a region of the world (i.e., Latin America) that has not been well-represented in the literature on SNSs adoption; thus, the literature benefits from the diversified perspectives offered by this study. By not employing the putative measures of frequency and volume of use that are commonly used by researchers to represent or operationalize SNSs acceptance, this study has expanded the horizons of SNSs adoption literature with its introduction of pervasive adoption, which included embracement and embedment in the use of such technologies. The amount of variance explained by pervasive adoption (i.e., 37%) in this study is both comparable and consistent with values reported in technology usage behavior research (Armitage & Conner, 2001; Taylor & Todd, 1995). Furthermore, it is shown that using frameworks that recognize social-related elements add to knowledge accumulation of factors influencing the adoption of social-based technologies such as SNSs. It is worth noting this study's results generally support existing knowledge in the area and expand knowledge of factors influencing students' extensive and profound engagements with social-based tools such as SNSs.

6.2. Practical implications

This study offers implications for practitioners as well. Given the pertinence of SI processes of internalization and identification, and UGT components of maintaining interpersonal connectivity and social enhancement in SNSs pervasive adoption, we recommend that SNSs designers and operators continue to pay attention to the development of services and functionalities capable of enhancing deeper cooperation, collaboration, and sense of community among committed users such as university students. As was revealed, students adopt SNSs pervasively when peers share similar val-

ues of such tools and have comparable motives for wanting to socialize using said tools (Madge, Meek, Wellens, & Hooley, 2009). Against such a backdrop, university administrators could encourage students to form close associations with peers sharing the same values as themselves so as to enhance cooperation and collaboration required for getting the most out of learning technologies used in higher education settings (Selwyn, 2009; Swan, Shen, & Hiltz, 2006). Platforms such as SNSs empower e-learning environments, particularly where higher engagement is entrenched (Selwyn, 2009).

Features and applications (apps) of SNSs which entertain or provide fun for students in virtual worlds or cyberspace should be harnessed in order to further enhance the benefits that students obtain from their online social engagements and participation. SNSs developers' attention is alerted to this reality, and university administrators and businesses can gain from information such as this. Specifically, businesses can take advantage of the power of SI processes and relevant UGT categories to better market their products and services over online social networks. Citing Dholakia et al. (2004), Pai and Arnott (2013) noted that marketers can design SNSs to leverage the functionalities in the components of UGT to create vivid and enjoyable interactions among SNSs users. Similarly, Eccleston and Griseri (2008) and Nambisan and Baron (2009) showed how marketers could utilize SNSs and related platforms to engender their marketing strategies and operations by capitalizing on social influences facilitated by such tools. Additionally, practitioners' attention is alerted to the role of national culture in SNS adoption; in this regard, desires to exploit and leverage extensive SNSs usage by students for educational, entertainment, or commercial purposes need not downplay the salient influence of culture, i.e., ID–CO, in particular. Knowledge of such may be useful when strategies required for providing SNSs based-services to students across different cultural contexts are being considered.

6.3. Limitations and future research directions

This study provides some interesting findings; nonetheless, it has several limitations that must be recognized. First, the data came from students using SNSs in four countries. It is not claimed that the results can be generalized to all student populations in the Americas and elsewhere. To increase generalizability, future research needs to consider sampling views from more countries.

Second, participants might have provided socially desirable responses to some of the issues being investigated. Such an occurrence could negatively impact the results; however, execution of the CMV test did not uncover problems with socially desirable responses. This study focused on SNSs in general. Simultaneously, it is possible that regional preferences regarding the use of such

tools might be problematic for the study. This is not a problem as the study's participants are familiar with some of the most popular SNSs, e.g., Facebook. Third, cross-sectional data serves the intended purposes of this exploratory study; however, longitudinal data may offer more conclusive information. Fourth, data used for this study was collected from university students. Caution should be exercised in generalizing the study conclusions to all populations, including professionals. Fifth, high correlations between some of the study's variables might be a problem.

More research is needed to understand why compliance and purposive value were found to be insignificant for students' pervasive adoption of SNSs. The items used to operationalize the constructs of embedment and embracement require further refinement as the process of validating a construct is never complete (DeVellis, 1991). Future studies should continue to expand the proposed research model by adding relevant factors, such as network externalities effects and social exchange theory, to improve knowledge in the area. Future research inquiries examining the possible effects of relevant antecedents on the categories of UGT and SI processes would be welcome. Information about the impacts of socio-economic and related factors on students' pervasive adoption of SNSs is needed for theory development.

7. Conclusion

Developing an understanding of factors likely to influence students' pervasive adoption of SNSs is an important endeavor for researchers' and practitioners' communities. This study does not claim to be the last word on the subject matter; more studies are needed to extend the frontiers of knowledge in the area. Researchers should continue to explore the influences of SI processes and categories of UGT on students' engrossment with such tools given the suitability of these paradigms in guiding the discourse. Studies in the area should seek to include perspectives from differing cultural contexts around the world to broaden insights. Practitioners can benefit from knowing which uses, gratifications and socialization elements to focus on as they leverage students' extensive use of such tools to serve the latter.

Acknowledgements

Appendix A.

A₁ Instrument deployment for new measuring items

Phase	Description
Phase1: Sampling frame	The population of interest is university students. This group is knowledgeable about SNS use (e.g., Pempek et al., 2009; Pew Research Center, 2015; Raacke and Bonds-Raacke, 2008; Ryan et al., 2014).
Phase1: Literature review and generating sample items	Information garnered from the literature (e.g., Vannoy & Palvia, 2010) and students' views on the subject matter provided guidance on potential items to include in the scales.
Phase 3: Purifying the items generated	The views of 3 IS professors and 8 students were sought to know if the items generated (i.e., initially 6 for each scale) capture or represent the issues being investigated. Comments on the clarity of the questions and length of the questions were entertained. At this stage, it was suggested that reducing the items on each scale to 4 would suffice. The subsequent classification of the remaining 8 items under embracement and embedment by 5 individuals (professors and students) indicated about 87% agreement among these raters. Additionally, the developed items benefited from comments received from reviewers who suggested that the construct of embedment is better operationalized by 2 items from the list.
Phase 4: Pre-test stage	Forty (40) individuals including professors, university workers, and students participated in the pre-test of an initial draft of the questionnaire. Comments received from the pre-test also helped to improve the quality of the final questionnaire.
Phase 5: Pilot test	To further test the validity of the items, 180 questionnaires were distributed among international students (i.e., Saudis, English, Nigerians, Chinese, Canadians, Egyptians, and Indians) in a Canadian university. Useful data was collected from 168 participants (i.e., with a response rate of 93%). Additional comments received from participants at this stage further improved the final questionnaire administered in the main study.
Phase 6: Data analysis (Exploratory factor analysis)	IBM SPSS Statistics 21.0 was used for data analysis. The principal component analysis with Varimax rotation was used. The scales of embracement and embedment and previously validated scales of perceived ease of use and perceived useful from TAM (Davis, 1989) were entered into the software. Factor loadings greater than 0.7 are considered adequate (Hair et al., 1998). Four (4) distinct factors emerged with each measuring item loading on its respective construct. The observed factors accounted for 70.36% of the variance in the model. The factor loading result is presented Appendix A₂.
Phase 7: Nomological validity	Nomological validity is established when constructs in an instrument correlates positively in the theoretically predicted way with measures of different but related constructs (Hair et al., 1998). In the main study ($N = 797$), we compared the scales of embedment and embracement to TAM's perceived usefulness (Davis, 1989). The results showed that perceived usefulness is related to embedment ($r = 0.59$, $p < 0.01$) and embracement ($r = 0.51$, $p < 0.01$). These results offer initial support for the scales' nomological validity.

Note: Extraction method: Principal component analysis; rotation method: Varimax with Kaiser normalization.

A₂ Factor loadings

	Embedment	Perceived usefulness	Perceived ease of use	Embracement
My interaction with SNSs (e.g., Facebook) is clear and understandable.	−0.040	0.020	**0.830**	0.030
It is easy for me to use SNSs.	0.079	−0.068	**0.876**	0.116
I find it easy to get SNSs do what I want them to do.	0.202	0.091	**0.728**	0.058
Using SNSs (e.g., Facebook) enable me to acquire more information or know more people.	0.233	**0.787**	−0.019	−0.322
Using SNSs improve my efficiency in sharing information and connecting with others.	0.184	**0.823**	0.000	0.251
SNS is a useful service for interacting between members	0.182	**0.858**	0.001	0.182
I accept that SNS (e.g., Facebook) is an integral part of my social life.	**0.771**	0.361	0.070	0.162
My group of friends accepts that SNS is an integral part of our social lives.	**0.713**	0.311	0.026	0.174
I foresee no difficulty in embracing, i.e., adopting willingly SNSs (e.g., Facebook) use.	0.276	0.267	0.136	**0.730**
My group of friends using SNSs sees no difficulty in embracing, i.e., adopting willingly this social tool.	0.266	0.220	0.091	**0.827**
Adopting SNSs willingly or eagerly is important to me.	0.305	0.222	0.071	**0.763**
Adopting SNSs willingly or eagerly is important to my group of friends.	0.318	0.121	0.079	**0.740**

Appendix B.

The questionnaire's items, their descriptive statistics, and item loadings

Construct	Measuring item	Mean	Standarddeviation	Loading
Compliance	My group of friends' views of SNSs (e.g., Facebook) use is similar to mine.	4.15	1.72	0.758
	It is necessary for my group of friends to use SNSs to be accepted among peers.	3.27	1.85	0.646
	Unless my group of friends sees the benefits of using SNSs, they would see no reason to spend extra effort in using such tools.	3.89	1.82	0.762
Identification	In our interactions, my group of friends feels a sense of ownership about the use of SNSs (e.g., Facebook).	3.85	1.63	0.817
	My groups of friends talk up the use of SNSs to other friends that have not joined.	3.98	1.78	0.883
	My group of friends is proud of using SNSs (e.g., Facebook).	4.18	1.78	0.868
Internalization	SNSs (e.g., Facebook) are important to my group of friends.	3.97	1.87	0.8
	The reason my group of friends use SNSs is that such tools provide some underlying social benefits.	4.37	1.73	0.902
	My group of friends likes using SNSs primarily because of the similarity between our values and the benefits that such tools provide.	4.17	1.71	0.859

Maintaining interpersonal interconnectivity	I use SNSs (e.g., Facebook) in order to have something to do with others.	3.68	1.82	0.82
	I use SNSs to stay in touch.	5.18	1.74	0.843
	Using SNSs enables me to connect with others.	4.92	1.74	0.782
Self-discovery value	I use SNSs (e.g., Facebook) to learn about myself and others.	4.41	1.76	0.873
	I SNSs to gain insight about myself.	3.26	1.82	0.772
	I use SNSs to have an understanding of myself and others.	4.42	1.98	0.559+
Purposive value	My own SNS (e.g., Facebook) page was created to get information.	3.63	1.87	0.826
	My own SNS page was created to generate ideas.	3.45	1.78	0.889
	My own SNS page was created to provide others with information.	3.67	1.81	0.846
	My own SNS page was created to solve problems and make decisions.	2.98	1.73	0.806
Social enhancement value	I joined SNSs (e.g., Facebook) to impress.	2.73	1.98	0.886
	I joined SNSs to feel important.	2.22	1.59	0.833
	I joined SNSs to enhance my social life.	4.58	1.85	0.634
Entertainment value	Using SNSs (e.g., Facebook) provides me with a lot of fun.	4.36	1.82	0.844
	I have fun using SNSs.	4.56	1.84	0.943
	The process of using SNSs is pleasant.	4.71	1.73	0.914
	SNSs (e.g., Facebook) do not bore me.	4.40	1.81	0.832
Behavioral intention to use SNS	Assuming I had access to the Internet, I intend to use SNSs (e.g., Facebook).	4.95	1.89	0.911
	I predict I will use SNSs in the coming 2 weeks.	5.36	1.91	0.966
	I am certain that I will use SNSs to interact with my friends in the coming 2 weeks.	5.36	1.94	0.944

Note: + removed from subsequent data analysis.

Appendix C.

Sources of data collection in each location

Country	Source of data collection
Canada	Dalhousie University, Halifax, Nova Scotia; Cape Breton University, Sydney, Nova Scotia; University of New Brunswick (NB)—Moncton, NB; Mount Royal University, Calgary, Alberta
USA	Fisk University, Tennessee; The University of Texas at El Paso, Texas
Mexico	Autonomous State University of Mexico, Toluca City; The University of Texas at El Paso, Texas, USA
Argentina	National Technological University, Resistencia; Universidad Nacional del Sur (UNS), Bahía Blanca; National University of La Plata, La Plata; Universidad Nacional del Comahue, Neuquén

Appendix D.

Factor loadings and cross-loadings of reflective constructs

	IDN	INL	CMT	PUV	ENT	SOE	SDV	MIC	BEH	IN-CO
IDN1	**0.817**	0.259	−0.039	0.087	−0.09	0.089	0.055	−0.023	0.047	−0.044
IDN2	**0.883**	−0.156	−0.012	−0.03	0.044	−0.041	−0.024	−0.013	0.009	0.03
IDN3	**0.868**	−0.085	0.049	−0.051	0.04	−0.042	−0.028	0.035	−0.054	0.011
INL1	−0.028	**0.8**	0.013	0.028	0.023	−0.144	−0.071	0.262	−0.244	−0.097
INL2	−0.007	**0.902**	0.04	0.004	−0.025	−0.017	−0.045	−0.03	0.081	0.025
INL3	0.034	**0.859**	−0.054	−0.031	0.004	0.153	0.114	−0.214	0.142	0.065
CMT1	−0.011	0.046	**0.758**	−0.122	0.053	0.04	0.109	−0.059	0.36	−0.075
CMT2	0.119	−0.031	**0.646**	0.053	0.041	0.217	0.099	−0.238	−0.287	0.12
CMT3	−0.09	−0.02	**0.762**	0.076	−0.087	−0.224	−0.192	0.26	−0.114	−0.027
PUV1	−0.036	0.044	−0.097	**0.826**	−0.048	−0.021	0.006	0.037	0.047	0.055
PUV2	0.003	−0.071	0.05	**0.889**	0.049	0.02	−0.055	−0.015	0.036	−0.033
PUV3	−0.119	0.057	0.018	**0.846**	−0.03	−0.063	−0.109	0.274	−0.074	−0.017
PUV4	0.159	−0.027	0.026	**0.806**	0.027	0.066	0.169	−0.309	−0.011	−0.002
ENT1	0.012	0.133	−0.009	−0.081	**0.844**	0.029	−0.047	0.07	−0.058	−0.013
ENT2	0	0.047	−0.027	−0.016	**0.943**	0.013	0.038	0.006	−0.003	0.038
ENT3	0.023	−0.088	−0.005	0.06	**0.914**	−0.057	−0.011	0.1	−0.014	−0.022
ENT4	−0.037	−0.091	0.045	0.034	**0.832**	0.018	0.017	−0.187	0.078	−0.006
SOE1	0.086	−0.071	−0.007	−0.014	−0.088	**0.886**	0.094	−0.271	0.097	0.029
SOE2	−0.101	0.06	0.052	0.009	−0.06	**0.833**	−0.087	0.165	−0.222	−0.11
SOE3	0.013	0.02	−0.058	0.007	0.201	**0.634**	−0.017	0.162	0.156	0.104
SDV1	−0.017	0.011	−0.024	−0.055	0.005	−0.132	**0.873**	−0.323	0.175	−0.054
SDV2	0.196	−0.125	−0.063	0.049	0.003	0.235	**0.772**	−0.296	−0.045	0.165
SDV3	−0.245	0.155	0.125	0.018	−0.012	−0.118	0.559+	0.913	−0.211	−0.144
MIC1	0.077	−0.049	0.008	0.032	0.059	0.063	0.23	**0.82**	−0.311	0.078
MIC2	−0.047	0.025	0.019	0.009	−0.048	−0.178	−0.058	**0.843**	0.213	−0.053
MIC3	−0.03	0.023	−0.029	−0.043	−0.01	0.125	−0.179	**0.782**	0.096	−0.025
BEH1	0.003	−0.003	0.01	−0.018	0.005	−0.035	0.016	0.061	**0.911**	−0.006
BEH2	−0.027	−0.009	0.012	0.013	−0.008	−0.014	−0.021	0.031	**0.966**	0.003
BEH3	0.025	0.012	−0.022	0.004	0.004	0.048	0.006	−0.091	**0.944**	0.003
IN-CO	0	0	0	0	0	0	0	0	0	1

Note: Cross-loadings are oblique-rotated; SDV = self-discovery value; PUV = purposive value; ENT = entertainment value; MIC = maintaining interpersonal interconnectivity; SOE = social enhancement value; IDN = identification; INL = internalization; CMT = compliance; ID–CO = individualism–collectivism index; BEH = behavioral intention to use SNS; PAD = pervasive adoption of SNS; + removed from subsequent data analysis.

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