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Social capital on mobile SNS addiction: A perspective from online and offline channel integrations

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# Social capital on mobile SNS addiction

## A perspective from online and offline channel integrations

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## Abstract

**Purpose** – Social capital has been identified as a valuable resource that can lead to various positive outcomes of social activities in both online and offline communities. The purpose of this paper is to argue that social capital can also be an important ingredient in the development of adverse outcomes, such as technology addiction.

**Design/methodology/approach** – Based on social capital theory and prior research related to perceived integration, a research model that reflects the effects of online and offline social capitals as well as perceived integration on mobile social networking service (SNS) addiction was developed and empirically examined based on data collected from 458 mobile SNS users in China.

**Findings** – The structural equation modeling analysis shows that online social interaction ties and online social supports positively affect mobile SNS addiction, whereas offline social supports and online social identification negatively affect mobile SNS addiction. In addition, perceived integration between online and offline channels by using mobile SNS positively influences online social interaction ties, offline social interaction ties, and mobile SNS addiction.

**Practical implications** – From the practical perspective, the results of the study offer interesting implications for managing mobile SNS addiction. The study found that online social interaction ties and online social support positively influence mobile SNS addiction, whereas offline social support negatively influence mobile SNS addiction.

**Social implications** – The mobile SNS users should invest more time to participate in offline social activities and maintain good social relationships with their family, colleagues, and friends in the real world.

**Originality/value** – The present study has both theoretical and practical implications. From a theoretical perspective, unlike many previous studies tend to regard social capital as the predictor of positive outcomes of users' social activities, the study contributes to the extant information systems literature by exploring the potential negative consequences of social capital on users' social lives. The results of the study indicate that social capital is a significant predictor of mobile SNS addiction.

**Keywords** Social identification, Social capital, Social support, Mobile SNS, Social interaction ties, Technology addiction

**Paper type** Research paper

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## 1. Introduction

As a web-based service which provides a function to constitute and share the social relation network, online social networking service (SNS) has increasingly established itself as a new paradigm of communication. In recent years, the proliferation of mobile devices has facilitated the rapid growth in use of mobile (SNS) (Lin *et al.*, 2015). Recent statistics from July 2014 showed that the number of mobile internet users in China has reached 527 million, accounting for 83.4 percent of the total amount of internet users (632 million) (CNNIC, 2014). By offering ubiquitous and convenient services to users, mobile SNS is creating a particularly significant change in the way of interactions between people's online and offline social lives. For instance, by using mobile SNS, users can instantly respond to their online social network members while they participate in the offline social activities. Mobile SNS serves as a "bridge" between offline face-to-face world and the internet-based virtual world to help users to maintain their existing relationships in both channels. In other words, as an agency, mobile SNS effectively integrated people's online and offline social lives. Despite mobile SNS gains rapid popularity and brings lots of benefits to their users, an excessive use of the services can also lead to technology addiction which is a problematic dependency on the information technology (Salehan and Negahban, 2013). It is reported that technology addiction not only is harming people's personal lives, but also raising organizations' concerns about their employee's productivity and privacy intrusion (Salehan and Negahban, 2013; Stieger *et al.*, 2013). Therefore, it is critical to understand the factors that affect users' mobile SNS addiction as well as the way to diminish or eliminate such problematic behaviors.

The objective of the present study is, therefore, to explore the factors that affect users' mobile SNS addiction from a social capital perspective by focussing on the determinants in both online and offline channels. Specifically, drawing on social capital theory and research associated with perceived integration, the present study investigates: what is the different role of users' online and offline social capitals (structural capital, relational capital, and cognitive capital) on shaping their mobile SNS addiction? How does perceived integration between online and offline channels by using mobile SNS affect users' mobile SNS addiction?

The present study makes several contributions. First, despite extensive effort has devoted to study mobile SNS behaviors in recent years, most of studies focus on the positive outcomes of mobile SNS usage that derived from its social benefits including connectedness, empathy support, and socialization (Kwak *et al.*, 2014). Rare of research examined how these social benefits that received from mobile SNS usage may result in a potential adverse consequence, such as mobile SNS addiction. The present study contributes to the literature by exploring the effects of the social benefits received from using mobile SNS on users' mobile SNS addiction behaviors from a social capital perspective. Second, most extant studies to data tend to identify factors that influence mobile SNS addiction in a single channel context. As users' social network life exists in both a physical space and a nonphysical cyberspace, examining mobile SNS addiction in the multiple channels would contribute to our understanding of mobile SNS addiction from a holistic sight. Third, the present study investigates the effects of perceived integration between online and offline channels by using mobile SNS on mobile SNS addiction.

The rest of this paper is organized as follows. A review of related literature on social capital is presented in Section 2. The research model and hypotheses are presented in

Section 3. Next, the research methodology is discussed in Section 4, followed by the data analysis in Section 5. The results are discussed in Section 6. Finally, the limitations as well as the implications are discussed in Section 7.

## 2. Literature review

### *2.1 Mobile SNS addiction*

As a special type of behavioral addiction, technology addiction is defined as "a user's maladaptive psychological state of dependency on the IT use which is manifested through an obsessive pattern of IT-seeking and IT use behaviors that take place at the expense of other important activities and infringe normal functioning" (Turel and Serenko, 2012, p. 514). Technology addiction can influence various aspects of an individual's life and sometimes may even need treatment (Turel *et al.*, 2011). It is different from the concept of habit, which reflects automatic actions owing to learning and such automatic behavior do not associate with psychological dependency (Turel *et al.*, 2011). Technology addiction also goes beyond the concept of high engagement within a technology or simply technology overuse, as these concepts usually do not relate to pathological technology usages. In fact, technology addiction is often manifested via several behavioral addiction symptoms, such as salience, conflict, withdrawal, tolerance, relapse and reinstatement, and mood modification.

While technology-related addictions are important phenomena and recently received an increasingly attention from both scholars and managers (Khang *et al.*, 2012), it is worthy to note that IT artifacts are not all equally addictive (Turel and Serenko, 2012; Yang *et al.*, 2014). It is generally believed that IT artifacts bring exciting or filling socio-psychological voids in people's social lives will be more addictive than others. The reason is that addictions usually bourgeon through the process of neural sensitization and positive reinforcement (Turel and Serenko, 2012). Thus, it is not surprising that the most frequent examples in the technology addiction research field are IT artifacts with hedonic features, such as online games applications (Jiang, 2014; Xu *et al.*, 2012), and social network services (Turel and Serenko, 2012).

Similar to the above mentioned addiction-prone information systems (IS), mobile SNS has emerged as a potentially addictive service that fills people's socio-psychological voids in their lives. Consistent with common addiction symptoms, mobile SNS addiction can be manifested through some core symptoms including behavioral salience (e.g. the use of the mobile SNS dominate other activities), conflict (e.g. the use of the mobile SNS interferes with other tasks), relapse and reinstatement (e.g. unable to voluntarily stop the usage of the mobile SNS), and withdrawal (e.g. negative emotions emerge if the mobile SNS cannot be accessed). By compared three types of addictions with computer games, online auction websites, and social network services, Turel and Serenko (2012) found that each technology-related addiction is similar with several core addiction symptoms including salience, conflict, relapse and reinstatement, and withdrawal. Thus, we adopt the measurements of mobile SNS addiction based on the research of Turel and Serenko (2012). Following previous studies, we defined mobile SNS addiction in the present study as mobile SNS users' a problematic dependency on the usage of the mobile SNS (Turel and Serenko, 2012; Yang *et al.*, 2014).

In academics, there are general three models from theoretical perspectives that can be used to explain the formation of mobile SNS addiction: the social skill model, the cognitive behavior model, and the socio-cognitive model (Turel and Serenko, 2012). The social skill model suggests that individuals who lack social or self-presentational skills prefer to engage in internet-based virtual communication rather than offline face-to-

face interactions. The cognitive behavior model proposes that individuals can form maladaptive cognitions which can be magnified by various environmental factors. For instance, mobile SNS users' maladaptive obsessive use patterns can be developed and amplified due to lacking of social supports and identification. The socio-cognitive model suggests that the individuals' compulsive usage behavior is encouraged by outcome expectancy, for example, mobile SNS users usually maintain social interaction ties with their online or offline communities to receive supports from others and to relieve loneliness. By combining the above mentioned social and cognitive behavior models, the present study intents to examine the effects of mobile SNS users' online and offline social capitals, as well as the integration level of online and offline channels by using mobile SNS on mobile SNS addiction.

### *2.2 Social capital theory*

Social capital is defined as "the sum of the actual and potential resources embedded within, and derived from the network of relationships possessed by an individual or social unit" (Nahapiet and Ghoshal, 1998, p. 243). Different from physical and financial capitals which generally focus on assets or personnel, the social capital describes the resources rooted in the structures of social networks that facilitate the various social interactions between people (Zhao *et al.*, 2012). Social capital is generally measured with three dimensions: structural, cognitive, and relational dimensions (Nahapiet and Ghoshal, 1998; Wagner *et al.*, 2014; Zhou *et al.*, 2010). The structural dimension of social capital refers to "the overall pattern of connections between actors-that is, who you reach and how you reach them" (Nahapiet and Ghoshal, 1998, p. 244). The structural capital is produced by the structure of the social network and the social interactions between actors. Therefore, the structural capital is fundamental to social capital because actors need to obtain the available resources and form social relationships via the social network ties (Zhao *et al.*, 2012). The cognitive dimension of social capital, on the other hand, refers to the resources that enable shared representations, interpretation, and systems of meaning among parties (Sun *et al.*, 2012; Zhao *et al.*, 2012). This dimension captures the common codes, language, and narratives that facilitate interactions among the actors in the social network. Finally, the relational dimension of social capital refers to "focuses on the particular relations people have, such as respect and friendship, that influence their behavior" (Nahapiet and Ghoshal, 1998, p. 244). This dimension of social capital involves assets created and leveraged through social relationships (Nahapiet and Ghoshal, 1998).

In academics, social capital theory has been applied to explain organizational and individual social behaviors in both the offline (face-to-face) and the online (internet-based) environments (Hsiao and Chiou, 2012; Wagner *et al.*, 2014; Zhao *et al.*, 2012). In the traditional offline context, for example, Chow and Chan (2008) examined the effects of social capital in organizational knowledge sharing. They found that social capital dimensions including social network and shared goals significantly contributed to a member's volition to share knowledge and the perception of social pressure of the organization. Lawson *et al.* (2008) found that relational and structural capitals are positively related to buyer performance improvements. Sun *et al.* (2012) also found that social capital factors positively affect user satisfaction with information technology service delivery in the financial context. In the online context, previous studies found that social capital is also an important motivation underlying individual knowledge getting and sharing behaviors in virtual community (Zhao *et al.*, 2012), continued intention to use online social network services (Lin and Lu, 2011), and loyalty in virtual community

(Hsiao and Chiou, 2012). More recently, Li and Wang (2014) applied social capital theory into the mobile SNS context and found that social capital factors are significant indicators of user's ad-sharing behavior in the mobile SNS environment.

As a result of these efforts, we have a much better understanding about the role of social capital in shaping users social behavior in both online and offline world. However, they also have limitations. First, extant studies mainly considered social capital as a salient factor that predicts positive outcomes of users' social behavior. Limited research has investigated how the social benefits derived from using social network services can lead to negative consequences, such as technology addiction. In fact, by providing users an opportunity to build social relationships with other group members, social network services are inherent a highly addictive application (Stieger *et al.*, 2013; Wang and Wang, 2013). Despite the common use of the mobile SNS for socialization, the link between social capital and mobile SNS addiction have not been well-explored. Second, extant studies only identified factors that affect mobile SNS addiction from a single channel perspective. Because of increasing popularity of mobile internet, people's offline social life has been effectively integrated with the emerging online social life. It is, therefore, important to explore the impacts of social capital on mobile SNS addiction from a multichannel perspective. Third, the effects of perceived integration between online and offline channels by using mobile SNS on user's social network behavior are rarely examined in previous studies. The present study tries to extend extant research beyond the above limitations.

Following the theoretical model of Nahapiet and Ghoshal (1998), the present study measures social capital with three distinct dimensions: structural, cognitive, and relational. In academics, among the most key factors of the structural dimension is the social interaction ties (Chiu *et al.*, 2006; Wang and Wang, 2013). Social interaction ties reflect the strength of the relationships, the frequency of communication, and the amount of time that spent among actors (Chiu *et al.*, 2006). Social support is the most important factor of the cognitive dimension, which defines as social assets or social resources that actors use when they need advice, assistance, or protection (Nahapiet and Ghoshal, 1998; Wang and Wang, 2013). Social identification is the most critical factor of the relational dimension, which refers to an individual's conception of self with a group that he or she is not a separate individual but a member of a community (Zhou, 2011). Therefore, based on the extant research, the structural dimension of social capital in the present study is manifested as social interaction ties, the cognitive dimension of social capital is manifested as social support, and the relational dimension of social capital is manifested as social identification.

## 3. Research model and hypotheses

Drawing on social capital theory and prior research related to perceived integration, the current study proposes a research model which captures the effects of both online and offline social capitals on users' mobile SNS addiction. As shown in Figure 1, three online social capital dimensions including online social interaction ties, online social supports, and online social identification positively affect mobile SNS addiction; in contrast, three offline social capital dimensions including offline social interaction ties, offline social supports, and offline social identification negatively affect mobile SNS addiction. Perceived integration of online and offline channels by using mobile SNS positively affects mobile SNS addiction directly and indirectly via the online and offline social interaction ties. Theoretical justifications of the hypotheses are discussed below.

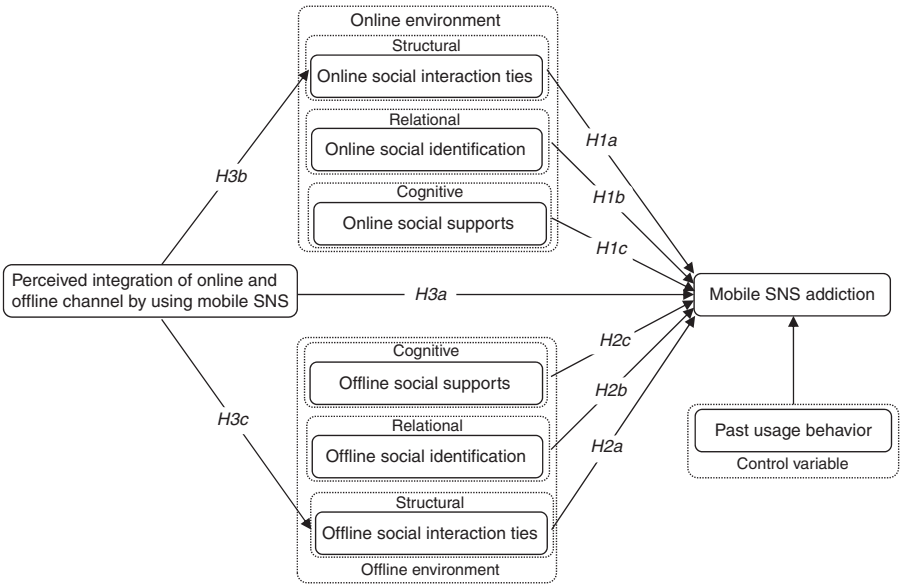


**Figure 1.**
Research model

### *3.1 Social capital and mobile SNS addiction*

Social capital theory has been applied in many different contexts including community participation (Zhao *et al.*, 2012), community loyalty (Hsiao and Chiou, 2012), and satisfaction with IT service delivery (Sun *et al.*, 2012). In addition to the positive outcomes of social capital, people's social interactions can also result in a potential negative consequence. Indeed, extant research proposed that abusing good things (the benefits of using mobile SNS in our case) can turn them into bad things (a pathological dependency on the mobile SNS) (Turel and Serenko, 2012). Previous research also reported that SNS inherent has addictive quality that high engagement users often have an irresistible and overpowering urge to check the online status of their friends repeatedly throughout the day (Stieger *et al.*, 2013). Given the multichannel context of our study, we focus on the effects of both online and offline social capitals on mobile SNS addiction. We believe that social capital in both online and offline channels as well as the integration level of online and offline channels by using mobile SNS are important predictors of mobile SNS addiction.

In the online environment, we proposes that three social capital dimensions including online social interaction ties, online social support, and online social identification will positively affect mobile SNS addiction. Indeed, individual members who participate in online community activities might develop close social interaction ties with other online community members (Wang *et al.*, 2012). These relationships will enable individual members to maintain an active social relationship with other online community members and receive social supports from them which in turn might lead to their psychological dependency on the online community (Wang and Wang, 2013). The more online social interactions undertaken by the community members, the more frequency, and intensity of the online information exchanged (Chiu *et al.*, 2006). Extant researches have also provided empirical support for the positive impacts of online social interaction ties, online social support, and online social identification on online social network services addiction (Douglas *et al.*, 2008; Yeh *et al.*, 2008). For instance,

Yeh *et al.* (2008) found that individual members who received social supports from their online community displayed signs of a high level of internet addiction. Xu *et al.* (2012) also found that users' social needs including a need to relationship and a need for escapism affect their online game addiction. Similarly, Wang and Wang (2013) examined the antecedents of internet addiction and found that online social supports and online social interaction ties positively affect internet addiction. Online social identification reflects an individual member's involvement with and belong to an online community and found to be an important sign to predict technology-related addiction (Kuss and Griffiths, 2011). In recent years, as the user's access to online services is increasing through their mobile devices, mobile services addiction has become an important issue that needs to be further explored (Salehan and Negahban, 2013). As mobile SNS belongs to the same interactive technology as the internet-based SNS, the factors that predict users' internet-based SNS addiction would be plausibly applicable to the mobile SNS context (Yang *et al.*, 2014). Based on the extant researches, we hypothesize that:

*H1a.* Online social interaction ties will positively affect mobile SNS addiction.

*H1b.* Online social identification will positively affect mobile SNS addiction.

*H1c.* Online social supports will positively affect mobile SNS addiction.

In contrast to online social capital, the present study proposes that the offline social capital including offline social interaction ties, offline social supports, and offline social identification will negatively affect mobile SNS addiction. In fact, it has been shown that social capital obtained in an offline community can potentially prevent technology-related addiction (Wang and Wang, 2013). Offline face-to-face social interactions offer people with warm and meaningful activities which can distract an addict's attention from engaging in the pathological usage of online social networks (Xu *et al.*, 2012). That is, the face-to-face social interactions can become a substitute for online social life. When people's needs for face-to-face social interactions in the real world and escaping an unwanted digital distraction are high, they might be less likely to engage in excessive uses of online social networks via mobile devices. Previous studies also found that social capital, such as social support, social interaction ties, and social identification received in the offline face-to-face environment depress technology-related addiction (Stieger *et al.*, 2013; Wang and Wang, 2013). Therefore, we can hypothesize that:

*H2a.* Offline social interaction ties will negatively influence mobile SNS addiction.

*H2b.* Offline social identification will negatively influence mobile SNS addiction.

*H2c.* Offline social supports negatively influence mobile SNS addiction.

### *3.2 Perceived integration of online and offline channel by using mobile SNS*

With its ability of anywhere and anytime access, the mobile technology has significantly changed the ways of people's online and offline social lives. In fact, mobile technology offers a promising opportunity for people to fulfill their social needs by effectively integrating their online and offline social activities. Based on extant research (Yang *et al.*, 2011), we defines perceived integration in our particular research context as the strength to which users perceive their online and offline social lives to be combined by using mobile SNS. The seamless integration of mobile technology into people's online and offline social lives facilitated the frequency of communication and amount of time spent among their social members, which in turn helped to develop a

psychological dependence on the mobile technology (Douglas *et al.*, 2008). As the structural dimension of social capital, social interaction ties reflects "the overall pattern of connections between actors" (Nahapiet and Ghoshal, 1998, p. 244). The higher people's online and offline social channels integrated by using mobile technologies, the greater social network interaction ties with their online and offline members formed. Thus, perceived integration of online and offline channels by using mobile SNS will have a positive effect on both online and offline social interaction ties. In addition, when people perceived a high level of integration between their online and offline channels by using mobile SNS, they will more likely to form an automatic and repetitive usage behavior of mobile services (Douglas *et al.*, 2008). Therefore, we can hypothesize that:

*H3a.* Perceived integration of online and offline channels by using mobile SNS will positively affect mobile SNS addiction.

*H3b.* Perceived integration of online and offline channels by using mobile SNS will positively affect online social interaction ties.

*H3c.* Perceived integration of online and offline channels by using mobile SNS will positively affect offline social interaction ties.

In the IS literature, past usage experience has found to be a potential factor that predicts subsequent user behaviors (Yang *et al.*, 2014). The present study thus includes mobile internet experiences as a control variable in our research model.

## 4. Methodology

### *4.1 Instrument*

The research model includes eight constructs. To ensure the validity of the instrument, all the scales were adapted from the well-established researches and measured with multiple items. Items of online and offline social interaction ties were adapted from Chiu *et al.* (2006). The items of online and offline social identifications were borrowed from Zhou (2011). Items of online and offline social supports were adapted from Wang and Wang (2013). Items of mobile SNS addiction were adapted from Turel and Serenko (2012). The questionnaire was measured with a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). As the original scales were in English and the data collected were in China, we conducted a back-translation procedure to ensure no differences existed between the English and Chinese versions.

To find an appropriate measure of perceived integration of online and offline channels by using mobile SNS, we conducted a thorough review on the published measures of perceived integration. We found that most of these measures were seemingly ad hoc, and many of them did not appear to be the rigorously developed and validated instruments. Therefore, following the procedures suggested by Churchill (1979), the present study developed our own scale for perceived integration of online and offline channels by using mobile SNS. First, based on the literature review on perceived integration in the multichannel context, we generated its initial scale. Second, we invited three professors from IS field to review the developed scale. Based on their suggestions, we revised some items to improve clarity of the scale. Third, we collected data and performed a confirmatory factor analysis (CFA) to purify the scale. The reliability and validity of the scale were assessed by using partial least squares (PLS). Finally, following these three steps, we obtained four items of perceived integration that show a high degree of reliability and validity. The final scales are listed in the Appendix 1.

*4.2 Sample*

The data for the current study were collected from the offline branches of China Mobile. China Mobile is the largest telecommunication operator in China; thus, we can reach a large number of mobile phone users at its offline branches. A convenient sampling method was adopted for the data collection. The questionnaire was distributed at three service branches of China Mobile in an Eastern China City where mobile commerce was relatively well-developed compared with other areas in China. Subjects were randomly intercepted on the service branches and asked whether they had experience of accessing online community via mobile applications (mobile APP) or not. Those who answered positively were requested to fill out the questionnaire based on their social interaction experiences with both online community members and their offline acquaintances. As an incentive for filling the questionnaire, each participant who completed the survey was given a five RMB worth gift as a reward. A total of 526 questionnaires were received, and 458 are valid after dropped those with many missing values, yielding a valid rate of 87.1 percent. The sample included 47.8 percent male and 53.2 percent female. Most respondents were in their 20s and 30s. The most frequently visited mobile SNS included WeChat, mobile Qzone and mobile Renren. The demographic statistic data in terms of gender and age are consistent with the report of CNNIC (2014), indicating a good representative of our data. Detailed descriptive statistics are shown in Table I.

## 5. Data analysis and results

*5.1 Reliability and validity*

Following the two-step structural equation modeling analysis procedure, the measurement model was first examined to test the reliability and validity of the constructs, and then, the structural model was examined to test the research hypotheses. First, a CFA was conducted to assess the reliability and validity of the constructs. As shown in Table II, the composite reliability and Cronbach's $\alpha$ coefficients of the constructs were all greater than the recommended level of 0.7, indicating good reliability of the scales. The average variance extracted (AVE) values of the constructs were all above the recommended benchmark of 0.5, suggesting good convergent validity of the scales.

**Table I.**
Demographic information of the respondents

| Measure | Item | Number ($n = 458$) | Percentage |
|---|---|---|---|
| Gender | Male | 219 | 47.8 |
| | Female | 239 | 52.2 |
| Age (years old) | $< 15$ | 2 | 0.4 |
| | 15-20 | 164 | 35.8 |
| | 21-25 | 151 | 33.0 |
| | 26-30 | 108 | 23.6 |
| | $> 30$ | 33 | 7.2 |
| Education | High school or below | 137 | 29.9 |
| | Two-year college | 148 | 32.3 |
| | Four-year college | 156 | 34.1 |
| | Graduate school or above | 17 | 3.7 |
| Occupation | Corporate | 225 | 49.1 |
| | Government | 21 | 4.6 |
| | Education | 39 | 8.5 |
| | Student | 121 | 26.4 |
| | Others | 52 | 11.4 |

| Variable | Item | Standard loading | Cronbach's $\alpha$ | CR | AVE |
|---|---|---|---|---|---|
| Online social identification (OSI) | OSI1 | 0.914 | 0.931 | 0.956 | 0.880 |
| | OSI2 | 0.959 | | | |
| | OSI3 | 0.938 | | | |
| Online social support (OSS) | OSSI | 0.907 | 0.927 | 0.948 | 0.821 |
| | OSS2 | 0.929 | | | |
| | OSS3 | 0.908 | | | |
| | OSS4 | 0.879 | | | |
| Online social interaction ties (OST) | OST1 | 0.964 | 0.926 | 0.964 | 0.913 |
| | OST2 | 0.956 | | | |
| Offline social identification (OFSI) | OFSI1 | 0.929 | 0.910 | 0.943 | 0.847 |
| | OFSI2 | 0.938 | | | |
| | OFSI3 | 0.893 | | | |
| Offline social support (OFSS) | OFSS1 | 0.900 | 0.912 | 0.938 | 0.792 |
| | OFSS2 | 0.922 | | | |
| | OFSS3 | 0.915 | | | |
| | OFSS4 | 0.817 | | | |
| Offline social interaction ties (OFST) | OFST1 | 0.958 | 0.901 | 0.953 | 0.910 |
| | OFST2 | 0.949 | | | |
| Perceived integration of online and offline channel by using mobile SNS (PINT) | PINT1 | 0.864 | 0.860 | 0.905 | 0.705 |
| | PINT2 | 0.836 | | | |
| | PINT3 | 0.800 | | | |
| | PINT4 | 0.855 | | | |
| Mobile SNS addiction (MSA) | MSA1 | 0.870 | 0.817 | 0.891 | 0.732 |
| | MSA2 | 0.865 | | | |
| | MSA3 | 0.828 | | | |

**Table II.**
Scale properties

To test the discriminant validity, we compared the square root of the AVEs of each construct and its correlation coefficients with other constructs. As shown in Table III, the square roots of the AVEs for each construct were higher than its correlation coefficients with other constructs, indicating good discriminant validity. We also listed the cross-loading matrix in Table AI. The internal loading of each distinct factor was obviously larger than the cross-loading on other factors, showing a clear loading matrix.

| | Means | SD | OSI | OST | OSS | OFSI | OFST | OFSS | PINT | MSA |
|---|---|---|---|---|---|---|---|---|---|---|
| OSI | 4.307 | 1.267 | *0.938* | | | | | | | |
| OST | 4.945 | 1.163 | 0.533 | *0.955* | | | | | | |
| OSS | 5.417 | 1.130 | 0.299 | 0.089 | *0.906* | | | | | |
| OFSI | 4.977 | 1.157 | 0.557 | 0.255 | 0.516 | *0.920* | | | | |
| OFST | 4.693 | 1.255 | 0.415 | 0.300 | 0.528 | 0.519 | *0.954* | | | |
| OFSS | 4.598 | 1.375 | 0.501 | 0.658 | 0.228 | 0.333 | 0.315 | *0.889* | | |
| PINT | 5.019 | 1.201 | 0.431 | 0.382 | 0.447 | 0.455 | 0.278 | 0.457 | *0.839* | |
| MSA | 4.263 | 1.613 | 0.088 | 0.242 | 0.181 | 0.082 | 0.120 | 0.130 | 0.264 | *0.856* |

**Notes:** OSI, Online social identification; OSS, online social support; OST, online social interaction ties; OFSI, offline social identification; OFSS, offline social support; OFST, offline social interaction ties; PINT, perceived integration of online and offline channel by using mobile SNS; MSA, mobile SNS addiction. [a]Diagonal elements are the square root of AVE. These values should exceed the inter-construct correlations for adequate discriminant validity

**Table III.**
Factor correlation coefficients and square roots of the AVE[a]

As the self-reported data were used in the present study, we conducted two statistical analyses to examine the possible severity of common method bias. First, we conducted a Harman's single-factor test on the eight constructs in our proposed model (Podsakoff and Organ, 1986). The results indicated that the largest variance explained by individual factor was 14.574 percent, suggesting that no single factor can explain the majority of the covariance in our proposed model (Podsakoff and Organ, 1986). Second, we modeled all items as indicators loading on a common method factor and compared it with the original measurement model. The results shown that the loading of the principal variables were all significant at the $p < 0.001$ level, while the loadings of the common method factor were all not significant. This indicates that the common method bias, again, was not a significant problem in our research.

### *5.2 Hypothesis testing*

The structure equation modeling software PLS (PLS-Graph version 3.01060) was used to analyze the research model and the corresponding hypotheses. PLS has fewer statistical identification issues and requests a relatively small sample size as compared with covariance-based structural equation modeling (CB-SEM). In addition, PLS provide a good approximation estimates to CB-SEM and more appropriate for exploration than confirmation. As shown in the Figure 2, except for *H2b* and *H2c*, all other proposed hypotheses were found to be supported. Specifically, in terms of factors in the online environment, the hypothesized paths from online social interaction ties and online social supports to mobile SNS addiction were both significant, thus validating *H1a* and *H1c*. Online social identification negatively affect mobile SNS addiction; thus, *H1b* was reversely supported. In terms of factors in the offline environment, offline social supports were negatively associated with mobile SNS addiction, supporting, supporting *H2a*. However, the hypothesized paths from offline social identification and offline social interaction ties to mobile SNS addiction were not

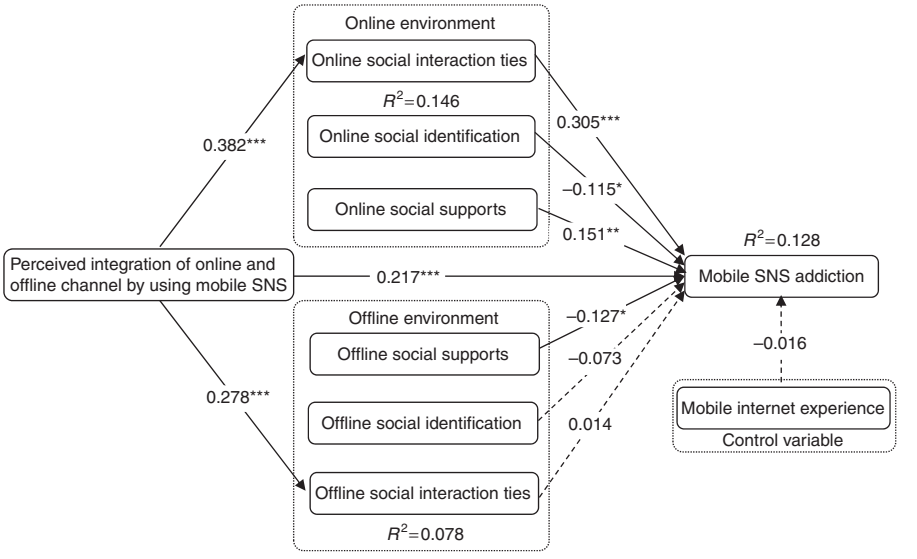


**Figure 2.**
Test results of the research model

**Notes:** *$p<0.05$; **$p<0.01$; ***$p<0.001$

significant. Thus *H2b* and *H2c* were not supported. The hypothesized paths from perceived integration between online and offline channels by using mobile SNS to online social interaction ties, offline social interaction ties, and mobile SNS addiction were all significant at $p < 0.001$ level, thus validating *H3a-H3c*. As the control variable, mobile internet experience did not significant affect mobile SNS addiction.

## 6. Discussion

Based on social capital theory and previous studies related to perceived integration, the present study examined the influences of social capital in both online and offline channels on users' mobile SNS addiction. This study also explores how perceived integration between online and offline channels by using mobile SNS affects users' mobile SNS addiction. This research provides some important findings.

First, in terms of social capital in the online channel, online social interaction ties, and online social supports were found to positively influence mobile SNS addiction. This is consistent with the findings of extant studies (Wang and Wang, 2013; Yeh *et al.*, 2008). The results provide further evidence that online social capitals can result in a potential negative consequence. Findings from this study suggest that social capital formed in an online social network not only contribute to knowledge sharing (Zhao *et al.*, 2012) and community loyalty (Hsiao and Chiou, 2012), but also can lead to mobile SNS addiction. However, in contrast to our proposed hypothesis, the present study found that online social identification has a negative influence on mobile SNS addiction. One plausible reason is that users with a high level of social identification are more likely to help other community members and share knowledge to the community. Unlike online social supports received from other online community members, the online social identification reflects the extent to which a user perceived himself as a valuable and importance member in the community (Zhou, 2011). Therefore, they are more likely to engage in rather than addict to the online community.

Second, in terms of social capital in the offline channel, offline social support was found to negatively affect mobile SNS addiction. This finding suggests that social supports occurring in the offline environment (e.g. among family, peers, and colleagues) decrease mobile SNS addiction. This is also consistent with the findings of Wang and Wang (2013) which found that offline social support negatively affects internet addiction. However, the impacts of offline social identification and offline social interaction ties on mobile SNS addiction were found to be insignificant. The potential explanation is the substitute effects between people's online and offline social lives. Indeed, previous studies suggested that in addition to meet new friends, people use online social networks to keep in touch with their offline friends (Subrahmanyam *et al.*, 2008). In fact, as online social interactions become an indispensable part of people's lives, the increasingly online social activities can affect many facets of people's offline social life (Xu *et al.*, 2012). People may need social supports from both the online and offline social members, their online and offline social identifications and offline social interaction ties tends to be interacted. That is, many people may have a high level of social identification and social interaction ties in the online social community but rarely have them in the offline social community, and vice versa.

Finally, the present study found that perceived integration of online and offline channels by using mobile SNS positively affects both online and offline social interaction ties. The findings suggest that mobile SNS effectively bridged people's online and offline social lives by increasing people's social interaction ties with their online and offline social members. Indeed, the ubiquitous, location-based and

personalized social services provided by mobile SNS are different from the services provided by the stationary PC-based counterpart. Mobile SNS users can use mobile APP to respond to their online community members when they are with their offline friends. The present study also found that perceived integration of online and offline channels by using mobile SNS has a strong and positive influence on mobile SNS addiction. This further validated perceived integration as a significant predictor of mobile SNS addiction. Despite great efforts have been devoted into understanding the effects of integration of online and offline channels, most studies reported the positive consequences of perceived integration on users' behaviors such as channel extension intentions (Yang *et al.*, 2011), differentiated use of multichannel systems (Schramm-Klein *et al.*, 2011), mobile services' cross-category promotions (Yang *et al.*, 2013), and loyalty intentions(Lee and Kim, 2010). Limited research examined the negative consequences of perceived integration on users' behaviors such as mobile SNS addiction. The results of the present study show that perceived integration affects mobile SNS addiction directly and indirectly via online social interaction ties. The control variable of mobile internet experience demonstrates no significant impact on mobile SNS addiction. This finding is in consistent with (Walsh *et al.*, 2011), which suggested that the usage patterns of mobile technology is not necessary a signal to predict mobile technology addiction.

## 7. Conclusion

### *7.1 Limitations*

Before delivering the implications of our study, a few limitations should be first acknowledged. First, to faithfully capture the association between social capital and mobile SNS addiction, an ideal research design would be a longitudinal analysis conducted over different periods. For instance, social interaction ties could be both an antecedent and a consequence of mobile SNS addiction. However, the cross-sectional nature of our study restricts such temporal analyses. Future research can employ a longitudinal design to test the causality between the social capital and mobile SNS addiction.

Second, the conceptualization of technology addiction is at an early development stage, and is still being debated by many medical scholars (Turel and Serenko, 2012; Yang *et al.*, 2014). A unified understanding on the cutoff criteria for classifying a technology user as an addict has not been formed. Future research can retest our proposed model by employing different conceptualizations of technology addiction.

Finally, it is worth noting that the sample of the present study was collected from mobile internet users related to a single company in a single country. While focussing on the particular mobile service users in a specific region can minimize unexplained variance in the model estimation, such narrow focus might also hinder the generalizability of the results. Future studies thus can test the research model in a different company and in a different culture context.

### *7.2 Theoretical and practical implications*

The present study has both theoretical and practical implications. From a theoretical perspective, unlike many previous studies tend to regard social capital as the predictor of positive outcomes of users' social activities, our study contributes to the extant IS literature by exploring the potential negative consequences of social capital on users' social lives. The results of our study indicate that social capital is a significant predictor of mobile SNS addiction. Second, unlike extant studies tending to examine the drivers of technology addiction within a single channel environment, the present study

investigates the factors that affect mobile SNS addiction from a multichannel perspective by focussing on its determinants in both online and offline channels. The results demonstrated that online social capital in combined with offline social capital significant affect mobile SNS addiction. Finally, the present study applied perceived integration into a multichannel context, and validated perceived integration as an important factor that influences mobile SNS addiction. The current study thus provided important insights on understanding mobile SNS addiction.

From the practical perspective, the results of our study offer interesting implications for managing mobile SNS addiction. First, our study found that online social interaction ties and online social support positively influence mobile SNS addiction, whereas offline social support negatively influence mobile SNS addiction. The implication for mobile SNS users is straightforward: they should invest more time to participate in offline social activities and maintains good social relationships with their family, colleagues, and friends in the real world. This is because interaction with offline social members can potentially lighten mobile SNS addiction. Second, this study also found that perceived integration between online and offline channel by using mobile SNS has positive impact on online social interaction ties, offline social interaction ties, and mobile SNS addiction. Despite mobile technology possesses an addictive quality by effectively integrated people's offline and online social activities, it is by nature a neutral IT artifact. In fact, the high level of integration between online and offline channel by using mobile technology enhances both people's online and offline social interaction ties. In other words, the usage of mobile SNS in some extent alleviates the problem emerging from the sole usage of online SNS which usually take place at the expense of other important offline social activities.

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## Appendix 1. The scales

*Online social interaction ties* (Chiu *et al.*, 2006).
OST1: I maintain close social relationships with some members in the online community (D).
OST2: I spend a lot of time interacting with some members in the online community.
OST3: I have frequent communication with some members in the online community.

*Online social identification* (Zhou, 2011).
OSI1: I am a valuable member of the online community.
OSI2: I am an important member of the online community.
OSI3: I am an influential member of the online community.

*Online social support* (Wang and Wang, 2013).
OSS1: Some members in the online community whose advice I really want.
OSS2: Some members in the online community who give I good advice about a crisis.
OSS3: Some members in the online community I can turn to for suggestions on how to deal with a personal problem.
OSS4: Some members in the online community I can do something enjoyable with.

*Offline social support* (Wang and Wang, 2013).
OFSS1: Some members (not in online land) whose advice I really want.
OFSS2: Some members (not in online land) who give I good advice about a crisis.
OFSS3: Some members (not in online land) I can turn to for suggestions on how to deal with a personal problem.
OFSS4: Some members (not in online land) I can do something enjoyable with.

*Offline social identification* (Zhou, 2011).
OFSI1: I am a valuable member of the offline community (not in online land).
OFSI2: I am an important member of the offline community (not in online land).
OFSI3: I am an influential member of the offline community (not in online land).

*Offline social interaction ties* (Chiu *et al.*, 2006).
OFST1: I maintain close social relationships with some members (not in online land) (D).
OFST2: I spend a lot of time interacting with some members (not in online land).
OFST3: I have frequent communication with some members (not in online land).

*Perceived integration of online and offline channel by using mobile SNS* (developed).
PINT1: The mobile SNS allows me to keep in touch with my online community members, while I participated in the offline social activities.
PINT2: The mobile SNS allows me to instantly respond to my online community members, when I participated in the offline social activities.
PINT3: The mobile SNS effectively mitigated the conflicts between my online and offline social activities.
PINT4: The mobile SNS effectively integrated my online and offline social activities.

*Mobile SNS addiction* (Turel and Serenko, 2012).
MSA1: I sometimes neglect important things because of my interest in this mobile SNS.
MSA2: I have made unsuccessful attempts to reduce the time I interact with this mobile SNS.
MSA3: Using this mobile SNS sometimes interfered with other activities.
MSA4: When I am not using this mobile SNS, I often feel agitated (D).

**Appendix 2.**

| Factor | OSS | OFSS | PINT | OSI | OFSI | MSA | OFST | OST |
|---|---|---|---|---|---|---|---|---|
| OSS1 | *0.850* | 0.099 | 0.144 | 0.218 | 0.014 | 0.065 | 0.102 | 0.102 |
| OSS2 | *0.860* | 0.109 | 0.223 | 0.215 | 0.067 | 0.056 | 0.024 | 0.049 |
| OSS3 | *0.850* | 0.043 | 0.170 | 0.158 | 0.073 | 0.054 | 0.057 | 0.224 |
| OSS4 | *0.783* | 0.038 | 0.120 | 0.060 | −0.021 | 0.186 | 0.107 | 0.179 |
| OFSS1 | 0.104 | *0.850* | 0.160 | 0.109 | 0.060 | 0.129 | 0.194 | 0.006 |
| OFSS2 | 0.088 | *0.889* | 0.152 | 0.080 | 0.117 | 0.105 | 0.141 | −0.006 |
| OFSS3 | 0.038 | *0.854* | 0.163 | 0.125 | 0.061 | 0.177 | 0.125 | −0.014 |
| OFSS4 | 0.023 | *0.810* | 0.179 | −0.010 | 0.040 | 0.287 | 0.125 | −0.012 |
| PINT1 | 0.244 | 0.260 | *0.727* | 0.122 | 0.096 | 0.108 | 0.049 | 0.183 |
| PINT2 | 0.149 | 0.271 | *0.789* | 0.097 | 0.049 | 0.059 | 0.051 | 0.027 |
| PINT3 | 0.130 | 0.013 | *0.799* | 0.184 | 0.168 | 0.122 | 0.061 | −0.024 |
| PINT4 | 0.184 | 0.192 | *0.754* | 0.080 | 0.092 | 0.254 | −0.011 | 0.126 |
| OSI1 | 0.238 | 0.135 | 0.149 | *0.832* | −0.043 | 0.221 | 0.068 | 0.113 |
| OSI2 | 0.224 | 0.081 | 0.149 | *0.877* | 0.052 | 0.193 | 0.152 | 0.141 |
| OSI3 | 0.241 | 0.110 | 0.194 | *0.792* | 0.033 | 0.280 | 0.123 | 0.176 |
| OFSI1 | 0.087 | 0.065 | 0.112 | 0.025 | *0.841* | −0.043 | −0.005 | 0.094 |
| OFSI2 | 0.049 | 0.064 | 0.090 | −0.054 | *0.833* | 0.064 | −0.033 | 0.165 |
| OFSI3 | −0.028 | 0.085 | 0.095 | 0.062 | *0.855* | 0.013 | 0.112 | −0.089 |
| MSA1 | 0.168 | 0.292 | 0.201 | 0.201 | −0.003 | *0.803* | 0.119 | 0.003 |
| MSA2 | 0.101 | 0.287 | 0.149 | 0.222 | 0.004 | *0.832* | 0.157 | 0.018 |
| MSA3 | 0.094 | 0.173 | 0.176 | 0.272 | 0.037 | *0.782* | 0.208 | 0.074 |
| OFST2 | 0.140 | 0.286 | 0.079 | 0.167 | 0.045 | 0.235 | *0.839* | 0.095 |
| OFST3 | 0.143 | 0.338 | 0.039 | 0.143 | 0.041 | 0.210 | *0.835* | 0.079 |
| OST2 | 0.436 | −0.040 | 0.162 | 0.285 | 0.132 | 0.038 | 0.131 | *0.756* |
| OST3 | 0.466 | −0.029 | 0.143 | 0.264 | 0.153 | 0.060 | 0.096 | *0.760* |
| Eigenvalues | 3.644 | 3.595 | 2.818 | 2.675 | 2.459 | 2.277 | 1.662 | 1.449 |
| Variance % | 14.574 | 14.381 | 11.270 | 10.698 | 9.835 | 9.107 | 6.647 | 5.798 |
| Cumulative | 14.574 | 28.955 | 40.225 | 50.924 | 60.758 | 69.865 | 76.513 | 82.310 |

**Table AI.**
Loadings and cross-loading

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