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Abstract: Social networking sites provide mobile applications to induce users to rely on and use them. Social media apps (SMAs) create, amplify, strengthen, disseminate, and consume social signals from peers and the general public. These signals are prolonging deep engagement and participation. SMAs take advantage of user needs (for belonging, self-actualisation, enjoyment, self-identity, and self-esteem), which results in the excessive use of SMAs, which then causes cognitive preoccupation. A total of 1,551 questionnaires indicated that belonging needs positively affect the excessive social use of SMAs. Self-actualisation and enjoyment needs positively affect the excessive hedonic use of SMAs. Self-identity and self-esteem needs positively affect the excessive cognitive use of SMAs. Excessive use (social, hedonic, and cognitive use) of SMAs positively affects cognitive preoccupation. SMAs must ensure the enjoyment and social needs of users. Regarding the balance between benefits and social responsibilities, SMA operators should provide healthy apps without causing conflicts in SMA users.

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1   Introduction

Mobile phones are now indispensable. Mobile phones can be used to receive and send e-mails, make audio and video calls, allow interactions on social network apps, run games, and enable sharing and viewing picture and videos. Social networking sites (SNSs) provide many mobile applications (e.g., Line, Facebook [FB], Twitter, and Instagram) to induce dependence and use (Saade and Bahli, 2005).

According to Statista statistics, the world's most popular SNSs or social media apps (SMAs) are WhatsApp, FB Messenger, and WeChat (Chatbot Trends, 2020). The monthly users of FB now number over 2.5 billion. The number of monthly FB users in the Asia-Pacific region accounts for 42% of global users, and the number of users in Taiwan accounts for 83% of its total population (Chatbot Trends, 2020). In Taiwan, the number of Line users is the largest and has reached 21 million, accounting for 90% of the population (Yi, 2020).

Social media differ from other media in the creating and consuming of social signals from peers and the masses. It amplifies, strengthens, and disseminates these signals. The signals are also changing our behaviour, for example lengthened engagement (Van der Heijden, 2004; Business Weekly, 2021). Excessive use and compulsive checking behaviour adversely affect the psychological and life outcomes and overall well-being of individuals, for example through technological addiction, the collection of a large amount of personal information, the implantation of false information, and internet fraud (Ho, 2021). A key component of problematic internet use is cognitive preoccupation (Tokunaga, 2012). Cognitive preoccupation entails obsessive thinking patterns that involve the use of technology. It is a psychological disruption usually related to some aspect of internet or technology use (Caplan, 2010; Haagsma et al., 2013).

Researchers have identified factors related to excessive SNS use and psychological problems. Most studies on SNSs have focused on the darker side of SNS use (Das et al., 2020; Ho and Ito, 2019; Cao and Yu, 2019; Cao et al., 2018). Some researchers have suggested socio-psychological factors such as belonging needs, self-esteem, self-identity, attitude (Ho et al., 2017), loneliness, stress, social anxiety (Ndasauka et al., 2016), enjoyment perception, social liquidity, demographics, habit, (Kwon et al., 2016), need for social interaction, need for achievement, need for escapism, and social anxiety (Kardefelt-Winther, 2014) to explain why users spend excessive time on SNSs or gaming apps.

Motivation theory can inform our understanding of behaviour and motivation. Motivation may be divided into extrinsic or intrinsic motivation (Shee and Peltier, 2020). In intrinsic motivation, people act purely because they like the action or express self-encouragement and self-interest in the activity or process (Oh and Syn, 2015).

Intrinsic motivation theory is always the antecedent in consumer attitudes or behaviour (Shee and Peltier, 2020; Watchravesringkan et al., 2010).

Studies of SNSs have focused on the darker side of SNS use. The present study hypothesised that motivation theory and intrinsic motivation theory could clearly explain the behaviour of and motivational factors related to SNS users. Accordingly, the study applied these theories as a basis to establish a model for explaining how needs motivate excessive SMA use to induce cognitive preoccupation through intrinsic motivation.

2 Literature review and hypothesis

Needs factors researchers have suggested that belonging needs (Ghatak and Singh, 2019; Wu and Li, 2020; Ho et al., 2017), self-esteem needs (Ghatak and Singh, 2019; Wu and Li, 2020; Ho et al., 2017), self-actualisation needs (Ghatak and Singh, 2019; Wu and Li, 2020), self-identity needs (Wu, 2019), and enjoyment needs (Hou and Shiau, 2020) are the key constructs in SMA use. Belonging needs include recognition, close ties, sympathy, and affection for others (Ghatak and Singh, 2019) and are involved in the emotional enhancement for maintaining the connectedness of SMA users (Wu and Li, 2020). Self-esteem needs include SMA user needs for recognition and care from society (Wu and Li, 2020). Self-actualisation needs describe development needs and reflect the personalised level in meeting users' personalised design needs (Ghatak and Singh, 2019). Self-identity is constructed by oneself and others to define and regard someone in social life (Jenkins, 2008). The needs of self-identity are an essential factor affecting privacy behaviour in SNSs (Wu, 2019). Enjoyment refers to an interactive process evoking pleasure, happiness, or interest (Hu and Tsai, 2009). Enjoyment needs are related to entertainment and arousal (Nishimura and King, 2007).

Excessive use of SMA excessive use of an SMA means that the use is longer than the planned time, or that an excessive amount of time or energy is spent on the platform (Caplan and High, 2006; Tandon et al., 2021). Cao and Yu (2019) applied user gratifications theory and suggested that excessive social media use comprises three constructs (excessive social use, excessive hedonic use, and excessive cognitive use). Alhashem et al. (2021) suggested that many personal benefits are derived from an online community, including hedonic factors of fun and enjoyment, cognitive benefits from problem solving and learning, and extra-personal and personal benefits generating from the use of social value. In this study, I adopted the approaches of Cao and Yu (2019) and Alhashem et al. (2021) to define three constructs of the excessive use of social media. Excessive social use refers to spending too much time strengthening contacts with others; excessive hedonic use refers to enjoyment, pleasure and emotional experiences derived from excessive use of an SMA; excessive cognitive use means that the user spends too much time and energy seeking information and knowledge by learning and problem solving.

Cognitive preoccupation cognitive preoccupation is a key component or symptom of problematic use of the internet (Tokunaga, 2012). Cognitive preoccupation refers to obsessive thinking modes that involve using a technology, and it is a psychological disruption in which a person is fixed on some aspect of technology or the internet (Caplan, 2010; Haagsma et al., 2013). For a person with such a preoccupation, the internet or technology becomes an inevitable medium. When the preoccupied person is

not using the internet or technology, the preoccupation persists with obsessive thoughts, anxiety, or discomfort (Shapira et al., 2000). Therefore, researchers have suggested that cognitive preoccupation exacerbates internet or SNS use and negative outcomes, especially for problematic use of the internet involving both cognitive preoccupation and behavioural modes (Shapira et al., 2000; Tokunaga, 2012; Zheng and Lee, 2016). Haagsma et al. (2013) reported that cognitive preoccupation with the internet may explain the problematic use of online gaming. Cao et al. (2018) suggested cognitive-emotional preoccupation and cognitive-behavioural control to explain the excessive use of mobile SNSs and negative outcomes.

This study reviewed the literature and examined the relationships among the excessive SMA use, cognitive preoccupation, and needs factors (belonging, self-actualisation, enjoyment, self-identity, and self-esteem).

2.1   Hypotheses

Our research model comprised the following groups of items: belonging needs, self-actualisation, enjoyment, self-identity, and self-esteem; excessive SMA use, excessive hedonic SMA use, and excessive cognitive SMA use; and cognitive preoccupation.

Belonging needs are at the third level in Maslow's hierarchy of needs. Belonging needs are attachment needs and close ones' love in life (Ghatak and Singh, 2019). They are social needs or love and belonging needs. A sense of belonging comes from the need for emotion and empathy in life. At present, people throughout the world keep in touch with family and friends through social media. Social media users are constantly updating their status. The number of people entering into relationships by joining social media is increasing (Quan-Haase and Young, 2010; Ghatak and Singh, 2019).

Social networking platforms are free from time and space constraints and provide individuals with an opportunity to maintain relationships with peers, friends, and family. Users also have the opportunity to freely express their ideas and obtain the approval of others (Ho et al., 2017). The need to belong is an intrinsic motivation; people want to naturally form and maintain long-lasting, meaningful, and positive interpersonal relationships (Baumeister and Leary, 1995). People with a high sense of belonging feel isolated and lonely when they cannot connect with their social network (family, friends, and peers). At this time, the use of social platforms becomes the main response substitute (Ledbetter et al., 2011). Again, intrinsic motivation refers to feelings of interest and satisfaction with an activity or process without external rewards or motivations (Ryan and Deci, 2000). With intrinsic motivation, high belonging-need individuals spend considerable time strengthening contact with others.

H1   Belonging needs positively affect the excessive social use of SMAs.

Self-actualisation embodies the individual's development towards satisfying the highest needs. Self-actualisation needs describe 'development needs' (Ghatak and Singh, 2019). An example is an individual enthused to take a specific course obtains successful outcomes, with their efforts fully appreciated (Ghatak and Singh, 2019). Self-actualisation is an efficient affective factor in intrinsic motivation (Deci, 1976). Self-actualisation is also an overall factor of intrinsic motivation (Epstein et al., 2013).

Social media use can result in self-actualisation or a higher level of happiness (Chou and Lim 2010). Happiness has two elements: hedonia and eudaimonia. Eudaimonia can

be produced by pursuing the use or developing the best side of oneself (Huta and Ryan, 2010). Further, eudaimonia moves to self-fulfilment, which is equal to self-actualisation. Self-actualisation is related to 'more ultimate' experiences. Eudaimonic activities also lead to hedonic enjoyment (Waterman et al., 2008). Social media provide a niche market where talented people share experience and knowledge and gain understanding (Ghatak and Singh, 2019). For self-actualisation, social media users would be happy and excited to engage in SMA use to increase their knowledge and self-development. This study applies intrinsic motivation theory to propose that with self-actualisation needs, individuals spend considerable time seeking enjoyable, pleasurable, and emotional experiences, resulting in the excessive use of an SMA.

H2 Self-actualisation needs positively affect the excessive hedonic use of SMAs.

Enjoyment refers to the feeling that an interactive process is interesting and causes pleasure or happiness (Hu and Tsai, 2009). Here, individuals engage in activities for the pursuit of happiness, but not for external rewards. Therefore, enjoyment is considered intrinsic motivation (Hu and Tsai, 2009). Enjoyment needs are related to the feeling of being awakened and entertained (Nishimura and King, 2007).

Enjoyment needs are the key reasons people use social media (Hou and Shiau, 2020). Social media site operators supply add-on applications, social games, or psychological tests that let users have fun and interact with others on the platform (Hsiao et al., 2016). Therefore, enjoyment needs prompt users to stay active on social media for long periods. On the basis of intrinsic motivation theory, this study proposes that the processes of an SMA providing the enjoyment needs of users result in users spending considerable time seeking enjoyable, pleasurable, and emotional experiences and resulting in the excessive use of an SMA.

H3 Enjoyment needs positively affect the excessive hedonic use of SMAs.

The need for self-identification represents how individuals need to understand themselves clearly (Schlenker, 1980) and includes an essential level of engaging in a behaviour for self-concept (Stryker, 1987). Social science has recognised that social interaction helps form self-identity (Jenkins, 2008; Mead, 1967). The 'person' implies the existence of others through an intersubjective entity. Individuals express self-identity and find self-understanding through circulation and negotiation (Floridi, 2011). Intrinsic motivation, in the form of feelings of personal expressiveness, was suggested as defining one dimension of identity (Waterman, 2004). Intrinsic motivation and self-identity are related (Werff et al., 2013).

Social media provide numerous opportunities to satisfy self-identity needs. Social media can help individuals through user names, displaying personal interests, avatars. Through social relationships, as well, users define themselves. Feedback and gathering information from social media represent one type of self-identity. Hence, individuals can know themselves by contemplating elements that can be used to define their self-identity and learning about others' perceptions (Min and Kim, 2015). When self-presented identities are confirmed in social interactions, people feel understood and satisfied (Goffman, 1967). Online community platforms supply the knowledge sharing process and opportunities for verification and identity expression (Ma and Agarwal, 2007). FB is a place to establish and share identities through exhibitionism and gossip (Bumgarner, 2007). Twitter users always self-censor tweets to maintain their self-image (Marwick and

Boyd, 2011). These social media characteristics may foster SMA dependence habits because users believe that strong membership with the online community is part of their identity and thus exhibit a high degree of satisfaction in participating (Aladwani, 2014; Zhang et al., 2011). Therefore, this study proposes that individuals with high self-identity needs will seek information and knowledge by problem solving and learning, leading to excessive use of SMAs.

H4 Self-identity needs positively affect the excessive cognitive use of SMAs.

Self-esteem needs are second from the top of Maslow's hierarchy and represent the need for recognition. Esteem comes from the heart. Compliments and positive feedback from those around one bring positive feelings and, in turn, increase self-esteem (Ghatak and Singh, 2019). The intrinsic motivator would be characterised by 'a sense of achievement that boosts self-esteem'. Hence, self-esteem is a main measure of intrinsic motivation (Vos et al., 2020).

Social media (e.g., FB, Instagram, and Line) provide instant gratification to raise morale and bring positive emotions. Social media induce confidence by providing a sense of self-identity and freedom (Muqaddas et al., 2017). Hence, social media use can amplify esteem effectively (Nyagh et al., 2015). A study revealed that individuals with high self-esteem or confidence used social media excessively for social enhancement (Kapidzic, 2013). This study proposes that individuals with self-esteem needs spend considerable time seeking information and knowledge by problem solving and learning, resulting in excessive use of SMAs.

H5 Self-esteem needs positively affect the excessive cognitive use of SMAs.

Social media allows one to keep in touch with people anytime and anywhere. In social support theory, individuals seek or provide support that is embedded in social networks through social relationships (Maier et al., 2015).

Individuals receive more messages from virtual friends on social media when the number of deep social relationships on social networks increases. To retain a large social network and to ensure the feelings of belonging and support, individuals must frequently check their social media to resonate as quickly as possible (Cao et al., 2016). As social media use increases, social networks become larger. According to the law of reciprocity in social relations, individuals may have more interaction and social support (Yang and Lin, 2017). Again, cognitive preoccupation represents compulsive thinking patterns involving technology use (Haagsma et al., 2013).

Excessive social use in this study refers to the frequent social use of an SMA, which triggers maladaptive cognition. In the cognitive-behavioural model (Davis, 2001), maladaptive cognition is considered a sufficient cause of problematic internet use symptoms. Maladaptive cognition includes distorted thoughts, thought processes, and cognitive focus (Caplan, 2010). Cognitive preoccupation, distorted thoughts, and the processes of thought can be classified as maladaptive cognitions (Caplan, 2010). Therefore, this study proposes that the excessive social use of an SMA induces cognitive preoccupation.

H6 Excessive social use of an SMA positively affects cognitive preoccupation.

Hedonic social media use represents the use of the technology for entertainment and fun (Ali-Hassan et al., 2015). Social media use can satisfy fantasy, sensory, or emotive aspects of hedonic gratification (Shivinder and Raj, 2020). The virtual self-consistency of

consumers induces self-expression value perception and social media consumption hedonic value, and ultimately motivates the use of social media (Khaldi, 2014).

Excessive use of mobile social networks generates cognitive and emotional preoccupation behaviour. Even if the behaviour is problematic, this use contributes to the occurrence of such behaviour (Zheng and Lee, 2016). Individuals may gradually form clusters in long-term memory and exhibit a tendency of behaviour related to responses from social media stimuli. The associative clusters between internal and external stimuli (e.g., social media notifications) can prompt a strong impulse for responding to cognitive and/or emotional emergencies (Turel and Qahri-Sarenmi, 2016). Therefore, this study proposes that the excessive hedonic use of an SMA induces cognitive preoccupation.

H7 Excess hedonic use of an SMA positively affects cognitive preoccupation.

The cognitive use of social media refers to creating and sharing content and accessing content derived from others. It also includes sharing bits and pieces of life such as opinions, ratings, and videos (Ali-Hassan et al., 2015). The theory of use and gratification suggests that media choice and specific content to meet specific needs are purely at the discretion of users, and users have the right to make their own choices.

Active users can evaluate media appropriate to their cognitive needs (Bae, 2018; Billings et al., 2017).

Knowledge and information access and comprehension are related to cognitive needs (Al-Ghamdi and Carlin, 2005; Leung, 2009; Stefanone et al., 2019). Cognitive preoccupation behaviour is at the core of impulsive behaviour. Impulsive behaviour, in turn, actively enhances the motivation to participate in which the state of motivation is irresistible (Collins and Lapp, 1992). Therefore, this study proposes that the excessive cognitive use of an SMA induce cognitive preoccupation.

H8 Excessive cognitive use of an SMA positively affects cognitive preoccupation.

3 Methodology

3.1 Survey design

This study employed convenience sampling to recruit responds from October 2020 to February 2021. The sample was expanded through the use of snowball sampling, with participants recruited from the acquaintances of EMBA students and graduates of CTBC Business School. Thus, the sample comprised adults in Taiwan who were aged older than 18 years and responded to an online questionnaire. The preface of the questionnaire stated that its purpose was purely academic, that there were no correct or incorrect answers that the survey was anonymous, and they were guaranteed confidentiality. Respondents were asked to consent before beginning the questionnaire. In all, 3,000 were invited to participate, and, at the data collection deadline, 1,551 questionnaires had been returned, with an effective recovery rate of 51.7%. To minimise the impact of common method variance (CMV), three methods were used in the questionnaire design.

First, to prevent respondents from falling into a model related to Likert or the semantic difference scale, open-ended dummy questions were interspersed throughout the questionnaire. Second, the anchor point of the scale varies by structure. Third, some items were reverse-coded.

The data was tested for CMV by using Harman's single-factor test. If CMV is a serious problem, a single factor will emerge from the factor analysis, or a general factor will explain most of the covariance in the standard variable (Podsakoff and Organ, 1986). Factor analysis was performed with all items, and nine factors with eigenvalues greater than 1 were extracted. In addition, no obvious general factor was observed in the unrotated factor structure, and factor 1 accounted for less than 20% of the variance. Therefore, the post hoc test indicated that CMV was not a serious problem.

3.2   Methods

First, the characteristics of the respondents were analysed using descriptive analysis. Second, the direct and indirect relationships between need factors (belonging, self-esteem, self-actualisation, self-identity and enjoyment), excessive use of SMAs (excessive social, hedonic, and cognitive use of SMAs), and cognitive preoccupation were assessed. AMOS 25 was used to perform confirmatory factor analysis (CFA) and structural equation modelling (SEM) of the scale to solve problems related to dimensionality and convergent and discriminant validity (Anderson and Gerbing, 1988). SPSS 17.0 was used to determine Cronbach's α and to perform Pearson product-moment correlation analysis to determine internal consistency and discriminant validity. Third, the relationships among all variables were clarified using correlation analysis. Finally, a nested model approach was employed using SEM to examine models (Niehoff and Moorman, 1993). The paths from need factors to cognitive preoccupation were estimated through this approach. AMOS 25 was employed for path analysis measuring the hypothesised relationships.

3.3   Measurement

Control variables. Many control variables were included in the analysis because prior studies have reported that these variables significantly influenced excessive social media use (Cao and Yu, 2019). In our analysis, gender was coded as follows: 0 = female and 1 = male. Age was defined as the number of years since birth. Moreover, total time of SMA use (in hours) per day was coded as follows: 1 = < 3 hours per day, 2 = 3–6 hours per day, 3 = 6–9 hours per day, and 4 = > 9 hours per day. The SMA opening frequency per day was coded as follows: 1 = < 20 times, 2 = 21–40 times per day, and 3 > 40 times per day.

The independent variable of this study was need factors (belonging, self-esteem, self-actualisation, self-identity, and enjoyment); intermediator variables were excessive social use, hedonic use, and cognitive use of an SMA; and the dependent variable was cognitive preoccupation. All items were measured using a five-point Likert scale ranging from 'strongly disagree' to 'strongly agree'.

Belonging needs the scale used to evaluate attachment needs and close ones' love in life consisted of seven items from the study of Leary et al. (2013). A higher score represents a higher need for belonging. An example item was 'I do not like being alone' ($\alpha = 0.882$).

Self-esteem needs the study used four items from the inventory developed by Patchin and Hinduja (2010) to measure self-esteem. An example was 'I think I have a lot of good qualities' ($\alpha = 0.891$).

Self-actualisation needs the scale measured the level of agreement. An example item was 'I am happy to share my feelings and emotions on SMAs' ($\alpha = 0.948$). The measures were adapted from the study of Ghatak and Singh (2019). There was three items to create a comprehensive index. A higher score indicates a higher need for self-realisation.

Self-identity needs this study used three items from the inventory developed by Callero (1985) to measure self-identity needs. One example was 'SMAs have become part of my life' ($\alpha = 0.866$).

Enjoyment needs Enjoyment needs were measured using three items developed and amended by Hu and Tsai (2009). One item was 'SMAs are fun' ($\alpha = 0.943$).

Excessive social use of SMAs Excessive social use of SMAs was assessed using four items developed and amended by Ali-Hassan et al. (2015) and Caplan and High (2006). An example was 'I spend a lot of time using SMAs to create new interpersonal/group relationships' ($\alpha = 0.929$).

Excessive hedonic use of SMA Excessive hedonic use of SMAs was measured using three items developed and amended by Ali-Hassan et al. (2015) and Caplan and High (2006). One example was 'I spend a lot of time using SMAs to relax' ($\alpha = 0.933$).

Excessive cognitive use of SMA Excessive cognitive use of SMAs was assessed using four items developed and amended by Ali-Hassan et al. (2015) and Caplan and High (2006). One example item was 'I spend a lot of time using SMAs to share information with my friends' ($\alpha = 0.922$).

Cognitive preoccupation the cognitive preoccupation scale contained eight items adapted from Collins and Lapp (1992) and Turel and Qahri-Saremi (2016). One example was 'I find that I cannot stop using SMAs' ($\alpha = 0.952$).

4 Data analysis and results

4.1 Sample characteristics

Table 1 demonstrated the respondent characteristics; 52.2% of the respondents were men, 48.6% were between the ages of 41 and 60 years; 25.9% worked in the service industry; 24.9% used Line, WeChat, and FB; 47.8% used SMAs 3–6 hours per day; 44.7% used an SMA fewer than 20 times a day, and 44.2% used an SMA 21–40 times per day.

Table 1 Characteristics of the respondents ($N = 1{,}551$)

	Frequency	*Percentage*
Gender		
Male	810	52.2
Female	741	47.8
Age (Years)		
Under 20	133	8.6
21–40	557	35.9
41–60	754	48.6
Above 60	107	6.9

Table 1   Characteristics of the respondents ($N = 1,551$) (continued)

	Frequency	Percentage
Industry		
High-tech	399	25.7
Service	401	25.9
Financial	30	1.9
Military/public/teaching	261	16.8
Freelance	154	9.9
Housekeeping	59	3.8
Student	233	15.0
Others	14	.9
Common use type of SMA		
Line	262	16.9
LineandWechat	91	5.9
LineandIG	115	7.4
LineandFB	386	24.9
LineandWechatandFB	151	9.7
LineandFBandIG	383	24.7
LineandWechatandIG	16	1.0
LineandWechatandFBandIG	147	9.5
The total time of using SMA per day		
Under three hours	460	29.7
3–6 hours	742	47.8
6–9 hours	174	11.2
Above nine hours	175	11.3
The times of using SMA per day		
Under 20 times	525	33.8
21–40 times	685	44.2
Above 41 times	341	22.0
The times of responding SMA per day		
Under 20 times	693	44.7
21–40 times	544	35.1
Above 41 times	314	20.2

4.2 Measurement model

This study used CFA to measure the problems of dimensionality and convergent and discriminant validity. Due to low standardised loadings ($p < 0.05$) or non-significant t values, some items were excluded. Items are deleted for scale purification or when similar patterns are observed in other empirical studies (Netemeyer et al., 2004). Table 2 indicates that the standardised loadings (ranging from 0.704 to 0.971) and all t values (14.303 to 27.011) were significant (e.g., CFI = 0.901, RMR = 0.045, TFI = 0.900,

RMSEA = 0.060). The standardised loadings of all 37 items were greater than 0.70. The magnitude of the loadings and its significant t value provided evidence of the validity of convergence. The composite reliability scores were between 0.866 and 0.948 (all > 0.7). The average variance value extracted exceeded 0.5 (Anderson and Gerbing, 1988).

Table 2   Scale items, reliabilities, and confirmatory factor analysis results

Scale items	Standardised loadings	t	Alpha
Belong needs			0.882
I want others to need me	0.714	24.635	
I do not like being alone	0.741	24.067	
I need to have a strong sense of belonging	0.792	22.594	
When I do not join other people's plans, it makes me feel very troubled	0.784	22.894	
I feel hurt when others do not accept me	0.834	20.743	
Self-actualisation needs			0.948
I will be happy to share and update everything that happens in my life in SMA	0.915	21.833	
I will be happy to share my feelings and emotional state on SMA	0.971	17.679	
I am happy to share and update my activity process and bits and pieces in SMA	0.914	20.463	
Enjoyment needs			0.943
SMA bring me fun	0.899	23.719	
SMA makes me very happy	0.960	15.936	
SMA makes me cheerful	0.914	22.814	
Self-esteem needs			0.891
Overall, I am very satisfied with myself	0.809	23.091	
I think I have a lot of good qualities	0.872	23.647	
I do many things better than most people	0.835	14.343	
I think I am a person worthy of being a good friend	0.776	23.677	
Self-identity needs			0.866
If I am forced to give up using SMA, I will feel at a loss	0.858	19.113	
For me, being a SMA user means more than just using SMA0	0.781	23.055	
SMA have become part of my life	0.846	19.986	
Excessive social use of SMA			0.929
I spend a lot of time using SMA to create new interpersonal/group relationships	0.884	22.156	
I spend a lot of time using SMA to meet people I would never meet	0.916	19.476	
I spend a lot of time using SMA to maintain close social relationships	0.867	23.033	
I spend a lot of time using SMA to meet people who share my hobbies	0.844	23.941	

Table 2   Scale items, reliabilities, and confirmatory factor analysis results (continued)

Scale items	Standardised loadings	t	Alpha
Excessive hedonic use of SMA			0.933
I spend a lot of time using SMA to make me feel rested	0.898	20.723	
I spend a lot of time using SMA to give me a chance to breathe during work	0.918	18.632	
I spend a lot of time using SMA to get me entertained	0.909	19.620	
Excessive cognitive use of SMA			0.922
I spend a lot of time using SMA to share information with my friends	0.0850	23.296	
I spend a lot of time using SMA to post and create information with friends	0.897	20.579	
I spend a lot of time using SMA to create and post information for my work	0.857	23.031	
I spend a lot of time using SMA to learn about friends' posting information	0.859	22.932	
Cognitive preoccupation			0.952
I found that I cannot stop using SMA	0.763	26.449	
I find it difficult to distract my desire to use SMA	0.784	26.249	
I think SMA is interfering with my daily activities	0.704	27.011	
If I cannot use SMA, I will feel very disappointed	0.923	22.093	
When I canot use SMA, I would miss extremely SMA	0.913	22.812	
When I am frustrated, I would be eager to use SMA	0.903	23.413	
When I am lonely, I would be eager to use SMA	0.893	23.911	
If I cannot use SMA, I would feel nervous	0.873	24.619	

In addition, the study used a series of pairwise CFAs to evaluate discriminant validity. First, a two-dimensional model was fit to each pair of research structures, and the items representing each factor were converted into a single-factor solution. For a two-factor model, various fitting statistics produce better results. The results strongly indicated that each set of items represented a potential structure, providing evidence of discriminative validity (Anderson and Gerbing, 1988). Internal consistency analysis was performed by calculating the α coefficient for each construct. According to Table 2, all alpha values were greater than Nunnally's (1978) recommended benchmark of 0.70.

The composite score of each construct was calculated by averaging the scores of the items representing the construct. In Table 3, the range of correlation coefficients among all constructs was from 0.004 (gender and enjoyment) to 0.817 (excessive social and cognitive use of SMAs). None of the correlation coefficients were equal to or higher than 0.90 (Tabachnick and Fidell, 1996), providing further evidence for discriminant validity. The composite score means and standard deviations are also provided in Table 3.

Age and cognitive preoccupation were significantly negatively correlated ($r = -0.110$, $p < 0.01$). Hours of SMA use per day, number of SMA uses per day, number of SMA responses per day, belonging need, self-actualisation need, enjoyment need, self-esteem need, self-identity need, and excessive social, hedonic, and cognitive use of SMAs were significantly positively correlated with cognitive preoccupation ($r = 0.194, 0.318, 0.247, 0.676, 0.514, 0.559, 0.203, 0.662, 0.745, 0.722,$ and 0.750, respectively; $p < 0.01$).

Table 3   Correlation of all variables ($N = 1551$)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Age	1													
2	Gender	0.076*	1												
3	Total using hours	-0.254**	-0.261**	1											
4	Opening times	-0.145**	-0.116**	0.489**	1										
5	Responding times	-0.104*	-0.020	0.334**	0.673**	1									
6	Belong	-0.271**	-0.042	0.250**	0.316**	0.272**	1								
7	Self-actualisation	-0.100*	-0.011	0.278**	0.261**	0.213**	0.569**	1							
8	Enjoyment	-0.124**	-0.004	0.261**	0.214**	0.189**	0.577**	0.734**	1						
9	Self-esteem	0.117**	0.036	0.013	0.219**	0.211**	0.255**	0.464**	0.424**	1					
10	Self-identity	-0.205**	-0.117**	0.348**	0.377**	0.318**	0.689**	0.708**	0.673**	0.338**	1				
11	Social use	-0.193**	-0.019	0.263**	0.359**	0.281**	0.664**	0.554**	0.594**	0.243**	0.586**	1			
12	Hedonic use	-0.253**	-0.020	0.323**	0.312**	0.226**	0.620**	0.656**	0.713**	0.233**	0.646**	0.792**	1		
13	Cognitive use	-0.132**	-0.075	0.248**	0.325**	0.247**	0.661**	0.557**	0.596**	0.251**	0.566**	0.817**	0.791**	1	
14	Preoccupation	-0.110**	-0.058	0.194**	0.318**	0.247**	0.676**	0.514**	0.559**	0.203**	0.662**	0.745**	0.722**	0.750**	1

Note: *$p < 0.05$; **$p < 0.01$.

AMOS 25 for path analysis was used to test the hypothesised relationships. Table 4 presents the model fit statistics. Collectively, they demonstrated that the research model favourably fit the data: $\chi^2 = 22,968.621$; degrees of freedom = 703; $p = 0.000$; CFI = 0.907; NFI = 0.911; GFI = 0.907; and AGFI = 0.904.

Table 4   Model test results

| Control variables and hypothesised relationships	Standardised parameter estimates	t-values	Accepted/ rejected
Impact on cognitive Preoccupation			
Control variable			
Age	–0.058*	–2.327	N/A
Gender	–0.015	–0.597	N/A
Total using SMA hours per day	0.032	1.121	N/A
Opening SMA times per day	0.250**	7.129	N/A
Responding SMA times per day	0.062	1.898	N/A
Belong needs → excessive social use of SMA	0.607**	29.918	Accepted
Self-actualisation needs → excessive hedonic use of SMA	0.138**	2.855	Accepted
Enjoyment needs → excessive hedonic use of SMA	0.780**	16.329	Accepted
Self-identity needs → excessive cognitive use of SMA	0.102**	2.691	Accepted
Self-esteem needs → excessive cognitive use of SMA	0.494**	20.116	Accepted
Excessive social use of SMA → cognitive preoccupation	0.290**	9.812	Accepted
Excessive hedonic use of SMA → cognitive preoccupation	0.271**	9.481	Accepted
Excessive cognitive use of SMA → cognitive preoccupation	0.297**	10.058	Accepted
$R^2 =$			
Fit statistics			
$X^2 = 22,968.621$, df = 703, p = 0.000			
CFI = 0.907			
NFI = 0.911			
GFI = 0.907			
AGFI = 0.904			
Root mean square error of approximation (RMSEA) = 0.060			
Root mean square residual (RMR) = 0.045			

Notes: CFI, comparative fit index; NFI, normed fit index; GFI, goodness-of-fit index; AGFI, adjusted GFI; RMR, root-mean-square residual.
  *$p < 0.05$; **$p < 0.01$.

The path analysis results supported the eight hypotheses proposed in the study (Figure 1). H1 states that belonging needs positively affect the excessive social use of

SMAs (β = 0.607, p < 0.05). H2 is that self-actualisation needs positively affect the excessive hedonic use of SMAs (β = 0.138, p < 0.05). H3 is that enjoyment needs positively affect the excessive hedonic use of SMAs (β = 0.780, p < 0.05). H4 states that self-identity needs positively affect the excessive cognitive use of SMAs (β = 0.102, p < 0.05). H5 posits that self-esteem needs positively affect the excessive cognitive use of SMAs (β = 0.494, p < 0.05). H6 states that excessive social use of SMAs positively affects cognitive preoccupation (β = 0.290, p < 0.05). H7 states that excessive hedonic use of SMAs positively affects cognitive preoccupation (β = 0.271, p < 0.05). Finally, H8 states that excessive cognitive use of SMAs positively affects cognitive preoccupation (β = 0.297, p < 0.05).

Figure 1 Hypothesised model (see online version for colours)
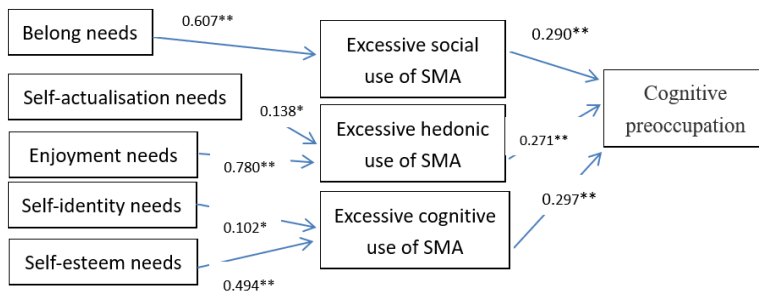
Note: *p < 0.05; **p < 0.01.

5   Discussion and conclusions

This study contributed to clarifying the framework for and relationships among need factors (belonging needs, actualisation needs, enjoyment needs, self-esteem needs, and self-identity needs), excessive use of SMAs (social use, hedonic use, cognitive use), and cognitive preoccupation. The findings indicate that belonging needs positively affect the excessive social use of SMAs (H1), self-actualisation needs positively affect the excessive hedonic use of SMAs (H2), enjoyment needs positively affect the excessive hedonic use of SMAs (H3), self-identity needs positively affect the excessive cognitive use of SMAs (H4), self-esteem needs positively affect the excessive cognitive use of SMAs (H5), excessive social use of SMAs positively affect cognitive preoccupation (H6), excessive hedonic use of SMAs positively affect cognitive preoccupation (H7), and excessive cognitive use of SMAs positively affect cognitive preoccupation (H8). The findings also indicate that younger SMA users and those who use apps more frequently have higher cognitive preoccupation.

This study argued that and empirical results confirmed that need factors (belonging, self-actualisation, enjoyment, self-esteem, self-identity) positively affect the excessive use of SMAs, and that excessive use of SMAs (social use, hedonic use, and cognitive use) positively affect cognitive preoccupation.

First, belonging needs positively affect the excessive social use of SMAs. Belonging and love are indispensable needs. An SMA is a readily available communication platform. For meeting intrinsic needs, an SMA is necessary to circulate information and

maintain social relationships. The argument of this study is consistent with that of Roberts and David (2020), who suggested that belonging needs are an innate driving force that determines most behaviour (social media intensity and social connection).

Second, self-actualisation needs positively affect the excessive hedonic use of SMAs. Self-actualisation needs are the highest needs and the robust factor of intrinsic motivation. Participating in knowledge and self-development activities through social media makes SMA users happy and enables their self-realisation. Eudaimonic activities and feelings also lead to hedonic enjoyment. This argument is consistent with that of Han (2012), who reported that the amount of information perceived on an SNS and the self-actualisation of users through sharing information with others on the site have a significant positive effect on the users' perceived usefulness of and perceived pleasure provided by the SNS.

Third, enjoyment needs positively affect the excessive hedonic use of SMAs. Among the five need factors, these needs had the strongest positive impact on the excessive use of SMAs. SMA users interact with other users and have fun with additional applications, social games, or psychological testing platforms provided by platforms. The feeling of being engaged and entertained can fulfil enjoyment needs. With SMA operators constantly creating new and interesting app types and with crowd interaction, enjoyment needs inevitably became the most prominent factor affecting the excessive use of SMAs, especially hedonic use. The argument of this study is consistent with those of Tamborini et al. (2011) and Gökhan and Ece (2021). Tamborini et al. (2011) concluded that media value should meet non-hedonic and hedonic needs (arousal and affect) to define media enjoyment. Gökhan and Ece (2021) suggested that the role of hedonic use included application aesthetics, perceived enjoyment, and the practical benefits of consumer behaviour in application market development satisfaction and application continuity willingness.

Fourth, self-identity needs positively affect the excessive cognitive use of SMAs. Self-identity represents the basic elements of engaging in a behaviour to achieve a personal self-concept. Individuals find self-understanding and express and establish self-identity through social interaction with others and through the process of continuous circulation and negotiation. SMA platforms (Line, FB, Instagram, and WeChat) supply processes for and opportunities to share, express, gossip, and verify, through which users maintain their self-image and identity. Self-identity needs can be met by the many opportunities of social media. This argument is consistent with that of Karahanna et al. (2018).

The current study proposed a need-availability-feature view of social media use, which assumes that the psychological needs of individuals motivate them to use SMAs to meet these needs. Fifth, then, self-esteem needs positively affect the excessive cognitive use of SMAs. The generation of and increase in self-esteem result from compliments and positive feedback from those around one, which provide positive recognition. SMA users use social media for real-time satisfaction through real-time interaction, increasing morale and confidence and fostering positive emotions. Therefore, to satisfy self-esteem needs, users with high self-esteem use SMAs. This is consistent with Cao's (2006) suggestion that in social cognitive theory, consumer value and behaviour are changed through the interaction of media use and cognition (self-esteem).

Regarding social use, SMAs can conveniently connect users with friends, family, acquaintances, and colleagues. To maintain a social network for support and a sense of social belonging, individuals must check their SMA frequently and resonate as quickly as

possible. Hedonic use of an SMA satisfies either fantasy, sensory, or emotive aspects of hedonic gratification (through the use of the technology for fun and entertainment). Cognitive use of SMAs involves encountering and evaluating media to select content and media that meet cognitive needs such as knowledge, information acquisition, and comprehension. Three types of excessive SMA use can induce maladaptive cognitions. Problematic internet use symptoms include cognitive preoccupation. This argument of this study is consistent with the findings of Carlson et al. (2016), who observed that social media use in the workplace may promote both productive behaviour (task-orientation and relationship building) and non-productive behaviour (deviance) at work.

Other findings of this study revealed that younger SMA users had higher levels of cognitive preoccupation, and the number of SMA uses day affected the cognitive preoccupation of SMA users. Younger SMA users have enough time to attend what they need, especially their belonging, self-actualisation, enjoyment, self-esteem, and self-identity needs. Satisfying many types of needs leads to excessive SMA use, which then induces preoccupation. This is consistent with the findings of Salmela-aro et al. (2017). They reported that students' use of social digital technologies (computer, internet, mobile, and social media) may lead to compulsive and addictive behaviour patterns. Concluding that the daily use of SMAs will affect cognitive preoccupation is reasonable; loading an SMA and paying attention to it will gradually become a habit and, unknowingly, an addiction. Wang et al. (2015) concluded that the development of psychological dependence on social media is explained by the theory of rational addiction, that is, dependence initially develops from habit.

6   Managerial implications

This study confirmed that need factors (belonging, self-actualisation, enjoyment, self-esteem, and self-identity) have a significant impact on the excessive use (social, hedonic, and cognitive) of SMAs. Excessive use affects cognitive preoccupation; excessive use of SMAs induces cognitive preoccupation. Mobile phones are extremely convenient, and SMAs are increasingly mutating to attract people. SMA operators must pay attention to the needs of consumers when updating or innovating their platform. In particular, the study found that among the need factors that affect the excessive use of SMAs, enjoyment needs exert the greatest impact (on hedonic use), followed by social needs (on their social use). The effect of self-esteem needs (on the cognitive use of SMAs) is the third-largest; self-actualisation needs have the fourth-largest effect (on the hedonic use of SMAs), and the fifth-largest effect is that of self-identity needs (on the cognitive use of SMAs). The results suggest that when updating or innovating apps, SMA operators must focus on enjoyment needs first, followed by social needs. Hence a 'gamification' approach may be considered by SMA providers during the initial development of the apps. Next, SMA operators must note that excessive social, hedonic, and cognitive use; younger age; and frequent SMA use are significant factors affecting cognitive preoccupation. Achieving a balance between benefits and social responsibilities such that SMAs can be used in a healthy and reasonable manner without causing conflicts with family, work, friends, and at the physiological level is a topic that SMA operators must consider carefully.

7   Limitation and further research

This study had methodological limitations. First, the findings are limited by the cross-sectional design. Second, the study used a self-report scale to measure need factors, excessive use of SMAs, and cognitive preoccupation, which may introduce bias. Third, the sample included only Taiwanese SMA Users; SMA users in other countries were not sampled.

Age and frequency of SMA use significantly affect cognitive preoccupation. Whether these two factors have a moderating effect on the relationship between need factors and cognitive preoccupation is a question worthy of discussion.

Regarding methodology, two approaches to data collection and analysis exist: qualitative and quantitative. A quantitative method (questionnaire) was used to test the hypotheses of this study. Therefore, sampling is not complete. In-depth interviews should be conducted to obtain richer findings.

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References

Aladwani, A.M. (2014) 'Gravitating towards Facebook (GoToFB): what it is? And how can it be measured?', *Computers in Human Behavior*, Vol. 33, p.270e278, http://dx.doi.org/10.1016/j.chb.2014.01.005.

Al-Ghamdi, M.A. and Carlin, D.B. (2005) *Saudi Arabian Television (First Channel) Touristic Programs: Uses and Gratifications and Perceptions of the Programs' Effect by Saudi Tourists Who Spend Their Summer Vacations Domestically*, University of KS, Ann Arbor [online] http://search. proquest.com/docview/304990762?accountid=10612 (accessed April 2020).

Alhashem, M., Moraes, C. and Szmigin, I.T. (2021) 'Use and social value in peer-to-peer prosumption communities', *European Journal of Marketing*, Vol. 55, No. 1, pp.193–218, https://doi.org/10.1108/EJM-03-2019-0235.

Ali-Hassan, H., Nevo, D. and Wade, M. (2015) 'Linking dimensions of social media use to job performance: the role of social capital', *The Journal of Strategic Information Systems*, Vol. 24, No. 2, pp.65–89, https://doi.org/10.1016/j.jsis.2015.03.001.

Anderson, J.C. and Gerbing, D.W. (1988) 'Structural equation modeling in practice: a review and recommended two-step approach', *Psychology Bulletin*, Vol. 103, pp.411–423, https://doi.org/10.1037/0033-2909.103.3.411.

Bae, M. (2018) 'Understanding the effect of the discrepancy between sought and obtained gratification on social networking site users' satisfaction and continuance intention', *Computers in Human Behavior*, Vol. 79, pp.137–153, DOI: 10.1016/J.CHB.2017.10.026.

Baumeister, R.F. and Leary, M.R. (1995) 'The need to belong: desire for interpersonal attachments as a fundamental human motivation', *Psychological Bulletin*, Vol.117, p.497e529, http://dx.doi.org/10.1037/0033-2909.117.3.497.

Billings, A.C., Qiao, F., Conlin, L. and Nie, T. (2017) 'Permanently desiring the temporary? Snapchat, social media, and the shifting motivations of sports fans', *Communication and Sport*, Vol. 5, No. 1, pp.10–26, DOI: 10.1177/2167479515588760.

Bumgarner, B.A. (2007) 'You have been poked: exploring the uses and gratifications of Facebook among emerging adults', *First Monday*, Vol. 12, p.11 [online] http://firstmonday.org/ojs/index.php/fm/article/viewArticle/2026/1897 (accessed May 2020).

Business Weekly (2021) *The Community Effect You Non-Notice Stimulates you to Vote and Donate*, Vol. 1745, April 22.

Callero, P.L. (1985) 'Role-identity salience', *Social Psychology Quarterly*, Vol.48, pp.203–215, https://doi.org/10.2307/3033681.

Cao, X. and Yu, L. (2019) 'Exploring the influence of excessive social media use at work: a three-dimension usage perspective', *International Journal of Information Management*, Vol. 46, pp.83–92, https://doi.org/10.1016/j.ijinfomgt.2018.11.019.

Cao, Q.D.X. (2006) 'The impact of American media exposure and self-esteem on Chinese urban adolescent purchasing involvement', *Journal of Family and Economic Issues*, Vol. 27, No. 4, pp.664–674, DOI: 10.1007/s10834-006-9038-3.

Cao, X., Guo, X., Vogel, D. and Zhang, X. (2016) 'Employing the influence of social media on employee work performance', *Internet Research*, Vol. 26, No. 2, pp.529–545, https://doi.org/10.1108/IntR-11-2014-0299.

Cao, X., Masood, A.B., Luqman, A.B. and Ali, A. (2018) 'Excessive use of mobile social networking sites and poor academic performance: antecedents and consequences from stressor-strain outcome perspective', *Computers in Human Behavior*, Vol. 85, pp.163–174, https://doi.org/10.1016/j.chb.2018.03.023.

Caplan, S.E. (2010) 'Theory and measurement of generalized problematic internet use: a two-step approach', *Computers in Human Behavior*, Vol. 26, No. 5, pp.1089–1097, https://doi.org/10.1016/j.chb.2010.03.012.

Caplan, S.E. and High, A.C. (2006) 'Beyond excessive use: the interaction between cognitive and behavioral symptoms of problematic Internet use', *Communication Research Reports*, Vol. 23, No. 4, pp.265–271, https://doi.org/10.1080/08824090600962516.

Carlson, J.R., Zivnuska, S., Harris, R.B., Harris, K.J. and Carlson, D.S. (2016) 'Social media use in the workplace: a study of dual effects', *Journal of Organizational and End User Computing*, Vol. 28, No. 1, p.15. DOI: 10.4018/JOEUC.2016010102.

Chatbot Trends (2020) *In the Era of Big Information, Which One Should you Choose for Line, Messenger, or Telegram?* April 30 [online] https://goskyai.com/tw/Blog/chatbot-trends/linemessengertelegramchatbot/ (accessed May 2020).

Chou, A.Y. and Lim, B.B.L. (2010) 'A framework for measuring happiness in online social networks', *Issues in Information Systems*, Vol. 11, No. 1, pp.198–203, https://doi.org/10.48009/1_iis_2010_198-203.

Collins, R.L. and Lapp, W.M. (1992) 'The temptation and restraint inventory for measuring drinking restraint', *Addiction*, Vol. 87, No. 4, pp.625–633, https://doi.org/10.1111/j.1360-0443.1992.tb01964.x.

Das, S.R., Mahmud, I., Ahmed, S., J-Ho, S.C. and Andalib, T.W. (2020) 'Fun or frustration: modelling discontinuance intention of social media users', *International Journal of Electronic Commerce Studies*, Vol. 11, No. 2, pp. 107-117. DOI: 10.7903/ijecs.1823.

Davis, R.A. (2001) 'A cognitive-behavioral model of pathological internet use', *Computers in Human Behavior*, Vol. 17, No, 2, pp.187–195, https://doi.org/10.1016/S0747-5632(00)00041-8.

Deci, E.L. (1976) 'The hidden costs of reward', *Organizational Dynamics*, Vol. 4. No. 3, p.6, https://doi.org/10.1016/0090-2616(76)90036-X.

Epstein, R.H., Clinton, M.S., Gabrovska, K. and Petrenko, O. (2013) 'Changes in motivation during an MBA program: gender makes a difference from first-year to graduation', *Academy of Educational Leadership Journal*, Vol. 17, No. 2, pp.103–120 [online] https://login.autorpa.lib.nccu.edu.tw/login?url=https://www.proquest.com/scholarly-journals/changes-motivation-during-mba-program-gender/docview/1368620523/se-2?accountid=10067 (accessed May 2020).

Floridi, L. (2011) 'The informational nature of personal identity', *Minds and Machines*, Vol. 21, No. 4, pp.549–566, DOI: 10.1007/s11023-011-9259-6.

Ghatak, S. and Singh, S. (2019) 'Examining Maslow's hierarchy need theory in the social media adoption', *FIIB Business Review*, Vol. 8, No. 4, pp.292–302, https://doi.org/10.1177/2319714519882830.

Goffman, E. (1967) *Interaction Ritual: Essays on Face-to-Face Interaction*, Aldine, Oxford, UK.

Gökhan, A. and Ece, A (2021) 'Hedonic and utilitarian benefits as determinants of the application continuance intention in location-based applications: the mediating role of satisfaction', *Multimedia Tools and Applications*, Vol. 80, No. 5, pp.7103–7124, DOI: 10.1007/s11042-020-10094-2.

Haagsma, M.C., Caplan, S.E., Peters, O. and Pieterse, M.E. (2013) 'A cognitive-behavioral model of problematic online gaming in adolescents aged 12-22 years', *Computers in Human Behavior*, Vol. 29, No. 1, pp.202–209, DOI: 10.1016/j.chb.2012.08.006.

Han, B. (2012) *An Investigation of Factors Influencing the User's Social Network Site Continuance Intention*, University of North Texas, ProQuest Dissertations Publishing, p.3573835 [online] https://digital.library.unt.edu/ark:/67531/metadc177209/ (accessed June–July 2020).

Ho, H. and Ito, K. (2019) 'Consumption-oriented engagement in social network sites: undesirable influence on personal well-being', *European Journal of Marketing*, Vol. 53, No. 7, pp.1355–1377, DOI: 10.1108/EJM-11-2017-0809.

Ho, S.S., Lwin, M.W. and Lee, E.W.J. (2017) 'Till logout do us part? Comparison of factors predicting excessive social network sites use and addiction between Singaporean adolescents and adults', *Computers in Human Behavior*, Vol. 75, pp.632–642, https://doi.org/10.1016/j.chb.2017.06.002.

Ho, Z.Z. (2021) 'When we use the product for free, it becomes a product', *Union News*, March 26, p.A12, Public Opinion Forum.

Hou, A.C.Y. and Shiau, W.L. (2020) 'Understanding Facebook to Instagram migration: a push-pull migration model perspective', *Information Technology and People*, Vol. 33, No. 1, pp.272–295, https://doi.org/10.26710/jbsee.v6i2.947.

Hsiao, C.H., Chang, J.J. and Tang, K.Y. (2016) 'Exploring the influential factors in continuance usage of mobile social apps: satisfaction, habit, and customer value perspectives', *Telematics and Information*, Vol. 33, No. 2, pp.342–355, https://doi.org/10.1016/j.tele.2015.08.014.

Hu, A.W.L. and Tsai, W.M.H. (2009) 'An empirical study of an enjoyment-based response hierarchy model of watching MDTV on the move', *Journal of Consumer Marketing*, Vol. 26, No. 2, pp.66–77, DOI: 10.1108/07363760910940438.

Huta, V. and Ryan, R.M. (2010) 'Pursuing pleasure or virtue: the differential and overlapping well-being benefits of hedonic and eudaimonia motives', *Journal of Happiness Studies*, Vol. 11, No. 6, pp.735–762, https://doi.org/10.1007/s10902-009-9171-4.

Jenkins, R. (2008) *Social Identity*, 3rd ed., Routledge, London.

Kapidzic, S. (2013) 'Narcissism as a predictor of motivations behand Facebook profile picture selection', *Cyberpsychology, Behavior and Social Networking*, Vol. 16, pp.14–19, http://dx.doi. org/10.1089/cyber.2012.0143.

Karahanna, E., Xu, S., Xu, Y. and Zhang, N. (2018) 'The needs-affordances-features perspective for the use of social media', *MIS Quarterly*, Vol. 42, No. 3, p.737, https://doi.org/10.25300/MISQ/2018/11492.

Kardefelt-Winther, D. (2014) 'Problematizing excessive online gaming and its psychological predictors', *Computers in Human Behavior*, Vol. 31, pp.118–122, https://doi.org/10.1016/j.chb.2013.10.017.

Khaldi, A. (2014) 'The effect of virtual self congruency on consumer's involvement in social media and the motivation to consume social media', *Journal of Business Studies Quarterly*, Vol. 6, No. 1, pp.184–190 [online] https://www.proquest.com/docview/1566312939/abstract/A09516524A304947PQ/1?accountid=10067 (accessed February 2021).

Kwon, H.E., So, H., Han, S.P. and Oh, W. (2016) 'Excessive dependence on mobile social apps: a rational addiction perspective', *Information System Research*, Vol. 27, No. 4, pp.919–939, DOI: 10.1287/isre.2016.0658.

Leary, M.R., Kelly, K.M., Cottrell, C.A. and Schreindorfer, L.S. (2013) 'Construct validity of the need to belong scale: mapping the nomological network', *Journal of Personality Assessment*, Vol. 95, pp.610–624, http://dx.doi.og/10.1080/00223891.2013.819511.

Ledbetter, A.M., Mazer, J.P., DeGroot, J.M., Meyer, K.R., Mao, Y. and Swafford, B (2011) 'Attitudes toward online social connection and self-disclosure as predictors of Facebook communication and relational closeness', *Communication Research*, Vol. 38, p.27e53, http://dx.doi.org/10.1177/0093650210365537.

Leung, L. (2009) 'User-generated content on the internet: an examination of gratifications, civic engagement and psychological empowerment', *New Media and Society*, Vol. 11, No. 8, pp.1327–1347, DOI: 10.1177/1461444809341264.

Ma, M. and Agarwal, R. (2007) 'Through a glass darkly: Information technology design, identity verification, and knowledge contribution in online communities', *Information Systems Research*, Vol. 18, No. 1, pp.42–67. DOI: 10.1287/isre.1070.0113.

Maier, C., Laumer, S., Eckhardt, A. and Weitzel, T. (2015) 'Giving too much social support: social overload on social networking sites', *European Journal of Information Systems*, Vol. 24, No. 5, pp.447–464, https://doi.org/10.1057/ejis.2014.3.

Marwick, A.E. and Boyd, D (2011) 'I tweet honestly, I tweet passionately: Twitter users, context collapse, and the imagined audience', *New Media and Society*, Vol. 13, No. 1, pp.114–133, https://doi.org/10.1177/1461444810365313.

Mead, G.H. (1967) *Mind, Self, and Society: From the Standpoint of a Social Behaviorist*, University of Chicago Press, Chicago.

Min, J. and Kim, B. (2015) 'How are people enticed to disclose personal information despite privacy concerns in social network sites? The calculus between benefit and cost', *Journal of the Association for Information Science and Technology*, Vol. 66, No. 4, pp.839–857, https://doi.org/10.1002/asi.23206.

Muqaddas, J., Sanobia, A.S. and Nawaz, A. (2017) 'Social media on self-esteem', *European Scientific Journal*, Vol. 13, No. 23, pp.329–341, DOI: 10.19044/esj.2017.v13n23p329.

Ndasauka, Y., Juan, H., Wang, Y., Yang, L., Yang, Z., Ye, Z., Hao, Y., Fallgatter, A.J., Kong, Y. and Zhang, X. (2016) 'Excessive use of Twitter among college students in the UK: validation of the micro blog excessive use scale and relationship to social interaction and loneliness', *Computers in Human Behavior*, Vol. 55, pp.963–971, http://dx.doi.org/10.1016/j.chb.2015.10.020.

Netemeyer, R.G., Brashear-Alejandro, T. and Boles, J.S (2004) 'A cross-national model of job-related outcomes of work role and family role variables: a retail sales context', *Journal of Academic Marketing Science*, Vol. 32, pp.49–60, https://doi.org/10.1177/0092070303259128.

Niehoff, B.P. and Moorman, R.H. (1993) 'Justice as a mediator of the relationship between methods of monitoring and organizational citizenship behavior', *Academy of Management Journal*, Vol. 36, pp.527–556, https://doi.org/10.2307/256591.

Nishimura, S. and King, B.E.M. (2007) 'The use of guidebooks by Japanese overseas tourists: a quantitative approach', *Journal of Travel Research*, Vol. 45, pp.275–284, https://doi.org/10.1177/0047287506295907.

Nunnally, J.C. (1978) *Psychometric Theory*, 2nd ed., McGraw-Hill, New York, NY, USA.

Nyagh, S., Nyagah, V., Asaatsa, S. and Mwania, M. (2015) 'Social networking sites and their influence on the self-esteem of adolescents in Embucounty, Kenya', *Journal of Educational Policy and Entrepreneurial Research*, Vol. 2, No. 1, pp.87–92 [online] https://www.iiste.org/Journals/index.php/JEPER (accessed January–February 2021).

Oh, S. and Syn, S.Y. (2015) 'Motivations for sharing information and social support in social media: a comparative analysis of Facebook, Twitter, Delicious, You Tube, and Flickr', *Journal of the Association for Information Science and Technology*, Vol. 66, No. 10, pp.2045–2060, DOI: 10.1002/asi.23320.

Patchin, J.W. and Hinduja, S. (2010) 'Cyberbullying and self-esteem', *The Journal of School Health*, Vol. 80, pp.614–621, http://dx.doi.org/10.1111/j.1746-1561.2010.00548.x.

Podsakoff, P.M. and Organ, D.W. (1986) Self-reports in organizational research: problems and prospects', *Journal of Management*, Vol. 12, pp.531–544, https://doi.org/10.1177/014920638601200408.

Quan-Haase, A. and Young, A.L. (2010) 'Uses and gratifications of social media: a comparison of Facebook and instant messaging', *Bulletin of Science, Technology and Society*, Vol. 30, No. 5, pp.350–361, https://doi.org/10.1177/0270467610380009.

Roberts, J.A. and David, M.E. (2020) 'The social media party: fear of missing out (FOMO), social media intensity, connection, and well-being', *International Journal of Human – Computer Interaction*, Vol. 36, No. 4, pp.386–392, DOI:10.1080/10447318.2019.1646517.

Ryan, R.M. and Deci, E.L. (2000) 'Intrinsic and extrinsic motivations: class definitions and new directions', *Contemporary Educational Psychology*, Vol. 25, No. 1, pp.54–67, https://doi.org/10.1006/ceps.1999.1020.

Saade, R. and Bahli, B. (2005) 'The impact of cognitive absorption on perceived usefulness and perceived ease of use in on-line learning: an extension of the technology acceptance model', *Information and Management*, Vol. 42, No. 2, pp.317–327, DOI: 10.1016/j.im.2003.12.013.

Salmela-aro, K., Upadyaya, K., Hakkarainen, K., Lonka, K. and Alho, K. (2017) 'The dark side of internet use: two longitudinal studies of excessive internet use, depressive symptoms, school burnout and engagement among Finnish early and late adolescents', *Journal of Youth and Adolescence*, Vol. 46, No. 2, pp.343–357, DOI: 10.1007/s10964-016-0494-2.

Schlenker, B.R. (1980) *Impression Management: The Self-Concept, Social Identity, and Interpersonal Relations*, Brooks/Cole Publishing Company, Monterey, CA.

Shapira, C.N.A., Goldsmith, T.D., Keck, P.E., Khosla, U.M. and McElroy, S.L (2000) 'Pshchiatric features of individuals with problematic internet sue', *Journal of Affective Disorders*, Vol. 57, pp.267–272. DOI: 10.1016/s0165-0327(99)00107-x.

Shee, B.A.V. and Peltier, J. (2020) 'Antecedent consumer factors, consequential branding outcomes and measures of online consumer engagement: current research and future directions', *Journal of Research in Interactive Marketing*, Vol. 14, No. 2, pp.239–268, https://doi.org/10.1108/JRIM-01-2020-0010.

Shivinder, N. and Raj, S. (2020) 'Social media use in academia: towards topology development and investigation of dominant use motive', *Journal of Information, Communication and Ethics in Society*, Vol. 18, No. 2, pp.255–280, DOI: 10.1108/JICES-08-2019-0093.

Stefanone, M.A., Yue, Z. and Toh, Z. (2019) 'A social cognitive approach to traditional media content and social media use: selfie-related behavior as competitive strategy', *New Media and Society*, Vol. 21, No. 2, pp.317–335, DOI: 10.1177/1461444818795488.

Stryker, S. (1987) Identity theory: developments and extensions', in Yardley, K. and Honess, T. (Eds.): *Self and Identity: Psychosocial Perspectives (89e103)*, Wiley, New York, USA.

Tabachnick, B.G. and Fidell, L.S. (1996) *Using Multivariate Statistics*, 3rd ed., Haper Collins College Publishers, New York, NY, USA.

Tamborini, R., Grizzard, M., Bowman, N.D., Reinecke, L. and Lewis, R.J. (2011) 'Media enjoyment as need satisfaction: the contribution of hedonic and nonhedonic needs', *Journal of Communication*, Vol. 61, No. 6, p.1025, DOI: 10.1111/j.1460-2466.2011.01593.x.

Tandon, A., Dhir, A., Almugren, I., AlNemer, G.N. and Mantymaki, M. (2021) 'Fear of missing out (FoMO) among social media users: a systematic literature review, synthesis and framework for future research', *Internet Research*, Vol. 31, No. 3, pp.782–821, https://doi.org/10.1108/INTR-11-2019-0455.

Tokunaga, R.S. (2012) 'A unique problem or the manifestation of a preexisting disorder? The mediating role of problematic internet use in the relationships between psychosocial problems and functional impairment', *Communication Research*, Vol. 41, No. 4, pp.53–560, https://doi.org/10.1177/0093650212450910.

Turel, O. and Qahri-Saremi, H. (2016) 'Problematic use of social networking sites: antecedents and consequence from a dual-system theory perspective', *Journal of Management Information System*, Vol. 33, No. 4, pp.1087–1116, https://doi.org/10.1080/07421222.2016.1267529.

Van der Heijden, H. (2004) 'User acceptance of hedonic information systems', *MIS Quarterly*, Vol. 28, No. 4, pp.695–704, https://doi.org/10.2307/25148660.

Vos, S.D., Ilicic J., Quester P.G. and Crouch, R.C (2020) 'Set yourself free! Exploring help-seeking motives in at-risk gamblers', *European Journal of Marketing*, Vol. 55, No. 4, pp.1203–1226, https://doi.org/10.1108/EJM-04-2019-0347.

Wang, C., Lee, M.K.O. and Hua, Z. (2015) 'A theory of social media dependence: evidence from microblog users', *Decision Support Systems*, Vol. 69, pp.40–49, http://dx.doi.org/10.1016/j.dss.2014.11.002.

Watchravesringkan, K., Hodges, N.N. and Kim, Y.H. (2010) 'Exploring consumers' adoption of highly technological fashion products: the role of extrinsic and intrinsic motivational factors', *Journal of Fashion Marketing and Management*, Vol. 14, No. 2, pp.263–281, DOI: 10.1108/13612021011046101.

Waterman, A.S. (2004) 'Finding someone to be: studies on the role of intrinsic motivation in identity formation', *Identity*, Vol. 4, No. 3, pp.209–228, DOI: 10.1207/s1532706xid0403_1.

Waterman, A.S., Schwartz, S.J. and Conti, R (2008) 'The implications of two conceptions of happiness (hedonic enjoyment and eudaimonia for the understanding of intrinsic motivation', *Journal of Happiness Studies,* Vol. 9, No. 1, pp.41–79, DOI: 10.1007/s10902-006-9020-7.

Werff, E.V., Steg, L. and Keizer, K. (2013) 'It is a moral issue: the relationship between environmental self-identity, obligation-based intrinsic motivation and pro-environmental behavior', *Global Environmental Change*, Vol. 23, No. 5, pp.1258–1265, DOI: 10.1016/j.gloenvcha.2013.07.018.

Wu, H. and Li, G. (2020) 'Innovation and improvement of visual communication design of mobile app based on social network interaction interface design', *Multimedia Tools and Applications*, Vol. 79, pp.1–16, DOI: 10.1007/s11042-019-7523-6.

Wu, P.F. (2019) 'The privacy paradox in the context of online social networking: a self-identity perspective', *Journal of the Association for Information Science and Technology*, Vol. 70, No. 3, pp.207–217, https://doi.org/10.1002/asi.24113.

Yang, H.L and Lin, R.X. (2017) 'Determinants of the intention to continue use of SoLoMo services: consumption values and the moderating effects of overloads', *Computers in Human Behavior*, Vol. 73, pp.583–595, https://doi.org/10.1016/j.chb.2017.04.018.

Yi, G.Y. (2020) 'LINE adjusts its Asian market strategy, Taiwan and Thailand become leading service and roles', *Taiwan Business Daily News*, November 28, Global Economic [online] https://udn.com/news/story/6811/5049767 (accessed January–February 2021).

Zhang, Y., Tang, L.S.T. and Leung, L. (2011) 'Gratifications, collective self-esteem, online emotional openness, and trait like communication apprehension as predictors of Facebook uses', *Cyberpsychology, Behavior, and Social Networking*, Vol. 14, pp.733–739, http://dx.doi.org/10.1089/cyber.2010.0042.

Zheng, X. and Lee, M.K.O. (2016) 'Excessive use of mobile social networking sites: negative consequences on individuals', *Computers in Human Behavior*, Vol. 65, pp.65–76, https://doi.org/10.1016/j.chb.2016.08.011.