When mobile phone use becomes problematic : the influence of self, parents and peers on adolescents' mobile phone behavior in Singapore and Malaysia

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**WHEN MOBILE PHONE USE BECOMES
PROBLEMATIC: THE INFLUENCE OF SELF,
PARENTS, AND PEERS ON ADOLESCENTS' MOBILE
PHONE BEHAVIOR IN SINGAPORE AND MALAYSIA**

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2018

**When Mobile Phone Use Becomes Problematic: The Influence of Self, Parents,
and Peers on Adolescents' Mobile Phone Behavior in Singapore and Malaysia**

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A thesis submitted to Nanyang Technological University
in fulfillment of the requirement for the degree of
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ABSTRACT

As mobile phones become prevalent in our daily lives, studies have been conducted to investigate the reasons behind the popularity of mobile phones. Mobile phones ease the communication between humans by overcoming geographical and time constraints. However, uncontrollable mobile phone usage could lead to negative consequences. Drawing on group socialization theory, this study investigates the factors affecting both mobile phone use and problematic mobile phone use among adolescents in Singapore and Malaysia. In particular, using survey questionnaire method, this study examines mobile phone use and problematic mobile phone use among adolescents by focusing on the three important agents of change in adolescents' life – the self, parents, and peers.

This dissertation comprises three parts. Using samples from Singapore and Malaysia, the first part of this dissertation validates the measurement of parental mediation and parenting styles. The second and third parts of this dissertation investigate the effects of adolescents' personalities (such as self-esteem, extraversion, neuroticism, and self-control), parental influence (such as parental mobile phone use, parenting styles, and parental mediation), and peer influence (such as peer mediation, peer norms, and peer capital) on both mobile phone use and problematic mobile phone use among adolescents in Singapore and Malaysia. In addition, this study also compares the intensity of mobile phone use and problematic mobile phone use among adolescents in both countries.

The results show that personalities, parents, and peers exerted considerable influence on Singaporean and Malaysian adolescents' mobile phone use. Specifically, peer influence accounted for the largest amount of variance in predicting adolescents' mobile phone use, followed by personalities and parental influence. This study found

that extroverted Singaporean and Malaysian adolescents are more likely to use mobile phones. In addition, the results show that peer discussion of mobile phone, injunctive norms, and peer capital are significantly associated with adolescents' mobile phone use in Singapore and Malaysia. In contrast, personalities accounted for the largest amount of variance in predicting problematic mobile phone use among adolescents in both countries. This study found that adolescents with higher neuroticism trait and lower levels of self-control are more likely to involve in problematic mobile phone use. Moreover, the findings show that authoritarian parenting, restrictive mediation, mobile monitoring, peer discussion, and injunctive norms are significantly associated with problematic mobile phone use.

The results also reveal that Singaporean adolescents have a higher frequency of mobile phone use as compared to Malaysian adolescents, but Malaysian adolescents tend to experience problematic mobile phone use more than their Singapore counterparts. This study contributes to the growing literature of mobile phone use and problematic mobile phone use by supporting the Big Five Theory, parenting styles model, parental mediation theory, social norm theory, and the social capital theory. This study also provides practical recommendations for policymakers, educators, and parents to mitigate problematic mobile phone use among adolescents.

CHAPTER ONE INTRODUCTION

Background

Mobile phones have become an important communication device around the world. The International Telecommunication Union reported that the world mobile phone subscriptions have exceeded 7 billion by the end of 2015, which is equivalent to a mobile phone penetration rate of 97% (International Telecommunication Union, 2015). With the evolution from traditional mobile phone to smartphones, the main functions of mobile phone are not only voice-calling and text-messaging. Smartphones inculcate the functions of other technologies, such as photographing, video recording, and Internet surfing. Indeed, popular mobile applications, such as Whatsapp, Wechat, and Facebook messenger, have slowly taken over the inbuilt Short Messaging System (SMS) function in mobile phones (Fibæk Bertel & Ling, 2016). The latest smartphones applications enable users to make voice calls, send text messages, and even video-calling as long as they are connected to the Internet. Nowadays, smartphones can almost be considered a “mini-computer” (Mutchler, Shim, & Ormond, 2011, p. 6; Trabalza, Raza, & Voigt, 2013, p. 114). Wei (2013) stated that mobile communication has transformed the definition of mass communication, in which some of the researchers (Chaffee & Metzger, 2001) described as “the end of mass communication”.

The ubiquity of mobile phone use has drawn the attention of researchers. Studies were conducted to investigate the impacts of mobile phone use on individuals. Extant research showed that mobile phone use can benefit users in terms of enhancing communication process between individuals by overcoming the constraints of time and space (Yang, Kurnia, & Smith, 2011). It helps to improve social connectedness and inclusiveness (Walsh, White, & Young, 2008; Wei & Lo, 2006). In addition,

mobile phones can enhance the sense of safety during emergencies (Walsh, White, Cox, & Young, 2011). Mobile phone is important to pre-adolescents as they are able to contact their parents when they are apart (Davie, Panting, & Charlton, 2004). Mobile phones are effective tools for enhancing interactive learning in classes (Scornavacca, Huff, & Marshall, 2009). In particular, smartphones are based on Internet which allows users to use the Internet and play games anywhere (Jo, Na, & Kim, 2018). Smartphones are more convenient than computer.

Despite the benefits, mobile phone use, especially smartphone use, has become a major concern as excessive use or overdependence on mobile phones may lead to many negative consequences among adolescents (Jo, Na, & Kim, 2018; Walsh et al., 2011; Walsh et al., 2008). Previous studies revealed that the use of mobile phones in school, college, or university reduces students' concentration in class (Balakrishnan & Raj, 2012; Walsh et al., 2011). Moreover, heavy mobile phone users have shorter duration of study and are more likely to become victims of crime and cyberbullying (Chen, Ho, & Lwin, 2016; Ishii, 2011). Researchers found that students were easily annoyed and distracted when their friends receive or make calls during lectures (Balakrishnan & Raj, 2012). Besides, dangerous driving practices, such as texting or making calls while driving, among young drivers have become more common (Merlo et al., 2013; Walsh et al., 2008). Most seriously, younger mobile phone owners who have no monthly income are getting into debt from the uncontrollable use of mobile services (Leung, 2008; Walsh, White, & Young, 2010). With regard to language, some critics have argued that the overuse of abbreviated acronyms, graphic accents, emoticons, and lingo instead of Standard English in mobile phones may affect the language skills of adolescents (Leung, 2008).

In addition, past studies showed that excessive mobile phone use was associated with health compromising behaviours such as smoking and alcohol drinking (Leena, Tomi, & Arja, 2005; Toda, Monden, Kubo, & Morimoto, 2006). Studies also found that frequent mobile phone users are more likely to experience somatic complaints, insomnia, social dysfunction, anxiety, and depression (Jenaro, Flores, Gómez-Vela, González-Gil, & Caballo, 2007; Thomée, Härenstam, & Hagberg, 2011). Sahin, Ozdemir, Unsal and Temiz (2013) argued that students' sleep quality deteriorates when the level of problematic mobile phone use increases. Hence, mobile phone overuse may be problematic. With the worrisome trend, it is worthwhile to explore predictors of mobile phone use and most importantly, the factors contributing to problematic mobile phone use.

Mobile Phone Use and Problematic Mobile Phone Use among Adolescents

This study examines mobile phone use and problematic mobile phone use among adolescents. In particular, this study focuses on the use of smartphones. Mobile phone use refers to the intensity of smartphone use. On the other hand, problematic mobile phone use refers to the inability to control one's mobile phone use that may resulted in negative consequences (Billieux, 2015).

Studies show that younger people tend to use mobile phones more frequently than older people, as the latter might need additional time to learn and to take more steps to operate the system (Conci, Pianesi, & Zancanaro, 2009). This implies that younger people are more likely to experience problematic mobile phone use (Bianchi & Phillips, 2005; Walsh & White, 2006; Walsh et al., 2010). For example, Bianchi and Phillips (2005) found that age was negatively associated with problematic mobile phone use. They found that young people were more likely to experience problematic mobile phone use. Similarly, Walsh and colleagues (2011) also found age to be

positively associated with mobile phone use and mobile phone dependency. Jo, Na, and Kim (2018) found that adolescents were more vulnerable to smartphone addiction.

Apart from empirical studies, statistics showed that among the smartphone users in the world, 18% of them are aged between 13 and 17 years old (Go-gulf, 2012). Interestingly, in most of the countries, this age group comprises of adolescents who are still attending school who do not have any monthly income. For most of the adolescents, mobile phones may not be a necessity in their daily life, it is rather to fulfil the social expectation of the peer group that are using mobile phone and a sense of inclusion (McClaychet, 2006). They acquire mobile phone because of the peer pressure to maintain the sense of belonging to the peer group (McClaychet, 2016). Furthermore, with the prevalence of smartphone, adolescents could easily connect with each other via social networking sites or other smartphone applications (Jo, Na, & Kim, 2018). Smartphone penetration rate among adolescents may not be the highest as compared to the other age groups, but they could be the cohort that is highly vulnerable to the potential negative impacts of mobile phone use (Bianchi & Phillips, 2005). Therefore, it is important to investigate the factors influencing mobile phone use and problematic mobile phone use among adolescents.

The Three Major Perspectives – Self, Parents, and Peers

Researchers suggested that there are few socialization agents that can influence adolescents' behaviour, including parents, peers, school, and mass media (Macionis, 2014; Shin & Lwin, 2017). Particularly, adolescence is the time when young people try to develop their own identity. They are at the age of confusion where their behaviours are influenced by different socialization agents (Macionis, 2014). According to group socialization theory (Harris, 1995), peer has crucial influence on adolescents' behaviour, especially in out-of-home context. Genetic and parental

influences cannot account for all the variance in a child's behaviours (Harris, 1995). In fact, young people learn how to behave at home and outside of home separately (Harris, 1995). Group socialization theory postulates that peer group is the source of out-of-home socialization process. In other words, peer group become the main socialization agents influencing adolescents' behaviour when they are outside of home. Given that mobile phone use takes place in both at-home and out-of-home contexts, this study seeks to investigate the genetic effects (personality), parental influences, and peer influences on adolescents' mobile phone use and their problematic behaviours.

Drawing on the group socialization theory as an overarching theoretical framework, this study is the first exploratory study aims to understand the influence of three socialization agents – self, parents, and peers, on adolescents' mobile phone use and problematic mobile phone use. Specifically, by applying the Big Five theory and social motive concept, this study examines the impact of self-esteem, self-control, extraversion, and neuroticism on adolescents' mobile phone use and problematic mobile phone use. This study also investigates the impacts of parenting styles and parental mediation on adolescents' mobile phone behaviours by applying the theory of parenting styles and parental mediation. To examine the influence of peers on adolescents' mobile phone behaviours, this study employs the concept of peer mediation, social norms, and social capital to examine the impacts of peer discussion, peer descriptive norms, peer injunctive norms, peer bonding capital, and peer bridging capital on adolescents' mobile phone behaviours.

Many of the previous research on problematic mobile phone use focus on the psychological and personality factors of the user (Augner & Hacker, 2012; Beranuy, Oberst, Carbonell, & Chamarro, 2009; Bianchi & Phillips, 2005; Jenaro et al., 2007;

Cho et al., 2017; Takao et al., 2009). However, the results of these studies are inconsistent (Billieux, 2012). For instance, Bianchi and Philips (2005) found that people with high extraversion and self-esteem tend to experience problematic mobile phone use, but not those with high neuroticism. Contrary to Bianchi and Philips' finding, Ezoe et al. (2009) found that extraversion and neuroticism are both predictors of problematic mobile phone use. Due to the lack of consensus on the psychological and personality predictors of problematic mobile phone use, there is a need to further examine the personalities of those who are highly involved in problematic mobile phone use. Likewise, there was inconsistency in terms of the relationship between personalities and mobile phone use based on past studies. For example, researchers found that extraverted and neurotic individuals spend more time using mobile phones, but not those with high self-esteem (Butt & Philips, 2008). Yet, other studies revealed that there was no significant relationship between neuroticism and mobile phone use (Inyang, et al., 2010; Lee, Tam, & Chie, 2014). The relationship between neuroticism and mobile phone behaviours should be delved deeper to provide further information for parents and teachers to tackle problematic mobile phone use among adolescents. Therefore, this study aims to investigate the relationship between personalities and problematic mobile phone use by applying the Big Five theory and social motives concept.

In addition to adolescents themselves, extant studies indicated that parents and peers are two important social agents who have considerable influence on adolescents' behaviours (Sasson & Mesch, 2014). Past research consistently reported that adolescents' misbehaviour was deterred by parenting (e.g. Fletcher, Steinberg, & Williams-Wheeler, 2004; Patock-Peckham, Cheong, Balhorn, & Nagoshi, 2001; Patock-Peckham & Morgan-Lopez, 2006). Likewise, parents play an important role in

regulating adolescents' mobile phone use and preventing them from falling into the problematic mobile phone use cohort. In most situations, adolescents tend to live with their parents as compared with older youths who might stay on campus or out of home (Walsh et al., 2010). They spend most of their time at home besides school. Thus, parents are responsible for educating their children, especially adolescents who are still under their care and financial support, to prevent adolescents from engaging in problematic mobile phone use. Parents also act as the role models for children, especially in media use (Vaala & Bleakley, 2015), and their behaviours and parent-child relations would affect adolescents' mobile phone use (Hong et al., 2012; Vaala & Bleakley, 2015). Drawing from previous research findings, this study seeks to examine the effect of parents' mobile phone use on adolescents' mobile phone use.

According to theory of parenting styles (Baumrind, 1967), there are three different types of parenting styles that could influence children's behaviours – authoritative parenting, permissive parenting, and authoritarian parenting. Parental mediation theory also posits that parents' communication practises could mediate the media effects on children and protect them from the potential negative impacts. Parental mediation theory is frequently applied in media research to examine media effects on younger audience (Mesch, 2009). However, most of the existing parenting styles and parental mediation research tend to focus on the context of Internet addiction and risky online behaviours (Eklund & Bergmark, 2013; Lee & Chae, 2012; Leung & Lee, 2012; Warren & Bluma, 2002; Lau & Yuen, 2013; Yang, Sato, Yamawaki, & Miyata, 2013). Given that problematic mobile phone use is also a type of technology addiction that is comparable to other established addiction (Salehan & Negahban, 2013; Leung, 2008), this study aims to explore the effects of parenting

styles and parental mediations on mobile phone use by applying the parenting styles and parental mediation theory.

As mentioned above, peer is one of the important agents in adolescents' social life. Apart from spending time at home, adolescents spend most of their time in school, either for curricular or after school co-curricular activities. This implies that in addition to parents, adolescents spend most of their time with their peers. Hence, peers might influence adolescents' mobile phone use as well as problematic mobile phone use. Indeed, Walsh et al. (2008) claimed that one of the advantages of mobile phone use is social inclusion and connectivity. Mobile phones facilitate adolescents in building their social network by helping them stay connected to their peers. Thus, social influences might affect mobile phone use among youths (Walsh et al., 2010). Yang et al. (2011) argued that individuals' social capital shape their mobile phone use and called for more studies to investigate the relationship between social capital and mobile phone use. Given that peers accounted for most of the adolescents' social life, this study seeks to answer the research call by exploring the effects of peer capital on adolescents' mobile phone use and problematic mobile phone use.

Moreover, a study on problematic television viewing found that peer mediation has stronger impact on adolescents' aggression as compared to parental mediation (Nathanson, 2001). It is suggested that the effects of peer mediation should be examined in other types of media (Nathanson, 2001), especially among adolescents in which both parental and peer mediations are present during their developmental stages. Shin and Lwin (2017) also suggested that future study should examine the different types of peer mediation and its impacts on adolescents' behaviour. Therefore, this study seeks to fill in the research gap by serving as a pioneer in exploring the

effects of peer mediation on adolescents' mobile phone use and problematic mobile phone use.

On the other hand, theory of social norms posits that human behavior is influenced by the perception of how the people in our social group think and act (Berkowitz, 2004). This theory is also well-applied in the mobile phone use context suggesting how peers may influence problematic behaviours among adolescents (Baumgartner, Valkenburg, & Peter, 2011). Extant studies that examined the effects of peer norms were only verified in the context of drinking behavior (e.g., Clapp & McDonnell, 2000; Korcuska & Thombs, 2003) and risky online behaviours (Baumgartner et al., 2011; Sasson & Mesch, 2014). There is a paucity of study that focuses on the effect of peer norms on problematic mobile phone use. Researchers suggested that future study should also apply social norms theory in the context of other problematic behaviours (Berkowitz, 2004). Therefore, this study fills the research gap by examining the influence of peer norms on adolescents' problematic mobile phone use.

While some empirical studies have been conducted in western countries (Eklund & Helmersson Bergmark, 2013; Warren & Bluma, 2002; Yardi & Bruckman, 2011), there is an absence of recent communication research on problematic mobile phone use in Southeast Asian countries, especially Singapore and Malaysia, that focuses on the perspectives of self, parents, and peers. This study serves as a seminal research that looks into the mobile phone use and problematic mobile phone use in Singapore and Malaysia from the three major perspectives.

Context of Study: Singapore and Malaysia

Singapore and Malaysia have been chosen as the context of this study due to several reasons. First, Singapore and Malaysia are countries with high mobile phone

subscriptions as compared to other ASEAN countries (ASEAN Secretariat, 2013). Second, Singapore and Malaysia have different policies in terms of mobile phone use in schools. These two countries can be used as proxies to compare the intensity of mobile phone use and problematic mobile phone use between adolescents who are allowed and not allowed to use their mobile phone within school compound. Third, adolescents and youths are the largest group of mobile phone users in both countries. Fourth, Singapore and Malaysia share some similarities in the historical background, yet both countries differ in the aspects of economic development, geographic and demographics. Hence, it is worthwhile to compare the mobile phone use and problematic mobile phone use among these two countries.

With respect to mobile phone subscriptions, Singapore has a total of 8.3 million mobile subscriptions in 2013 with 154.5% penetration rate (Infocomm Development Authority of Singapore [IDA], 2013). Mobile phone use occupies the central place of Singaporeans' life. The total mobile phone penetration rate in Singapore increased from 2.8 million mobile subscriptions in 2001 to more than 8.3 million mobile subscriptions in 2012 (IDA, 2013). Mobile phones, especially smartphones that have more sophisticated functions, are widely used among the younger generation. A nationwide representative survey in Singapore showed that youths aged between 15 and 24 years old has the highest usage of smartphone (Infocomm Media Development Authority [IMDA], 2015). Among those aged between 15 and 24 years old, 92% of them are smartphone users. In addition, Singapore was ranked first among 10 ASEAN countries in terms of the number of mobile phone users in 2011 (ASEAN Secretariat, 2013). Similarly, mobile phones have become a part of Malaysians' daily lives where mobile phones are used to keep in touch with friends, family and colleagues (Zulkefly & Baharudin, 2009). The total

mobile phone penetration rate in Malaysia in 2014 was 144.2%, with a total number of 43, 248, 000 mobile phone subscriptions (Malaysian Communication and Multimedia Commission [MCMC], 2014). A national representative survey conducted by MCMC showed that most of the children in Malaysia get their first hand at the age of 12. Many of the adolescents aged between 13 and 15 years old are mobile phone users (38.9%). More surprisingly, among children mobile phone owners below 18 years old, 57.6% of them have a smartphone. Malaysia was ranked third among ten ASEAN countries in terms of the number of mobile phone users in 2013 (ASEAN Secretariat, 2013). An annual mobile phone survey carried out by the Malaysian Communication and Multimedia Commission in 2012 showed that the highest percentage of mobile phone users in Malaysia were those aged between 20 to 24 years old followed, by those aged between 25-29 years old.

Although both Singapore and Malaysia have high mobile phone subscriptions, the government policies of mobile phone use and the access to Internet are relatively different. In Singapore, the Ministry of Education encourages the use of information and communication technology in the learning process, including mobile phone device (Today, 2014). Every school is given the authority to regulate the mobile phone use among their students. Many schools allow their students to bring their mobile phones to school for academic purposes (Zulkifli, 2009), however mobile phone use is prohibited during curriculum hours. Contrary to Singapore, mobile phone use is totally banned in schools in Malaysia. Students are not allowed to bring their mobile phones into school compounds (Dom, 2009). If they do so, the mobile phone has to be submitted to the teacher-in-charge. Else, disciplinary actions will be taken upon those who violated the rules (Dom, 2009). On the other hand, as smartphones become prevalent and affordable, people tend to use their mobile phones to surf the Internet,

especially when they are away from their personal computers. As mobile phones allow people easy and fast access to surf the Internet, this explains the high intensity of its use nowadays. However, Internet regulations in Singapore and Malaysia are different. There is no Internet censorship in Malaysia since it was announced by the former Prime Minister of Malaysia, Dr. Mahathir, during the launch of Multimedia Super Corridor project in 1996 to attract investors (George, 2005). As compared to Malaysia, the Singapore government has blocked pornographic sites while licensing scheme is compulsory to all the political websites (George, 2005).

As mentioned previously, in both Singapore and Malaysia, adolescents and youths make up the majority of mobile phone users who have high intensity of mobile phone use (iDA, 2013). These adolescents and youths are mostly students in secondary schools and tertiary institutions who have no regular monthly income. Although mobile phones facilitate students to keep in touch with peers, send or receive email, and information search during the learning process, high intensities of mobile phone use can lead to problematic outcomes among these students. For instance, excessive mobile phone use has led to financial problems among young users (Billieux, 2012; Takao et al., 2009; Walsh et al., 2011) and a lack of concentration in study (Walsh et al., 2011). Furthermore, studies (Charlton, Soh, Ang, & Chew, 2013) found that female Malaysian students with low religiosity are more likely to become addicted to Internet.

Singapore and Malaysia are two neighbouring countries that share some similarities and yet, differ in many aspects. Singapore is a developed country with a Gross Domestic Product (GDP) of 51 thousand USD per capital ("GDP per Capital (current US\$)," 2013), while Malaysia is a developing country with GDP of 10 thousand USD per capital ("GDP per Capital (current US\$)," 2013). Contrary to the

GDP, Singapore is a small island-nation (716.1 square kilometers) with the population of more than 5 million people ("Department of Statistics Singapore", 2013) as compared to Malaysia. Malaysia is a country located on the northern part of Singapore that has a total land area of 330 thousand square kilometers with a total population of 29 million people ("Statistical Handbook Malaysia 2012", 2012).

Despite the differences in land area and GDP, Singapore and Malaysia share some similarities in historical background. Both Singapore and Malaysia were once occupied by Japan and Britain (Liu, Lawrence, Ward, & Abraham, 2002). Malaysia (so-called Malaya at that time) gained its independent in 1957, followed by Singapore in 1959. (Liu, Lawrence, Ward, & Abraham, 2002). Later on in 1963, Singapore merged with Peninsula Malaya, Sabah, and Sarawak to form one nation. However, due to political disagreements between the leaders of Singapore and Malaya, Singapore withdrew from the merger and became independent in 1965. Apart from that, Singapore and Malaysia are both multiracial, multi-cultural, multi-lingual, and multi-religious countries (Wah, 2006). Both countries are made up of Chinese, Malay, Indian, and other minorities, but differ in terms of ratio. In Malaysia, Malay is the largest ethnic group (63.1%), Chinese is the second largest (24.6%), followed by Indians (7.3%), and other minorities (0.7%) ("Population Distribution and Basic Demographic Characteristic 2010," 2010). However, majority of the Singaporeans are Chinese (74.3%), followed by Malay (13.4%), Indian (9.2%), and others minorities (3.3%) ("Department of Statistic Singapore", 2015). Moreover, Singapore and Malaysia differ in term of religious compositions. Malaysia is an Islamic country in which 61.3% of Malaysian are Muslims ("Population Distribution and Basic Demographic Characteristic 2010," 2010). As for Singapore, most of the population

are Buddhists or Taoists (44.2%), followed by Christians (18.3%), Muslims (14.7%), and Hindu (5.1%) (“Department of Statistic Singapore”, 2015).

In addition, both Singapore and Malaysia are multi-lingual countries but differ in terms of lingua-franca. English is the official language in Singapore. Singaporeans use English in their daily activities and official events. Most Singaporeans are bilingual as they also learn their mother tongue such as Mandarin, Malay, and Tamil in school. In Malaysia, the official language is Malay language (Bahasa Malaysia). Both Malay and English will be used in official events. Malay language is the lingua-franca among Malaysian, although some communicate in English. Malay and English are both compulsory subjects for all students regardless of the ethnicity. In addition to Malay and English, Malaysians also speaks their native languages such as Chinese, Tamil or local dialects.

Despite the historical background and some demographic aspects, Singapore and Malaysia are two distinct countries, especially in the regulations of mobile phone use in schools and the censorship of Internet. There is a paucity of recent literature comparing the mobile phone use and problematic mobile phone use between these countries. Therefore, using Singapore and Malaysia as proxies for differences in school policy in terms of mobile phone use, this study seeks to investigate and compare the factors contributing to mobile phone use and problematic mobile phone use in these two countries.

Research Objectives

This study aims to achieve several research objectives. First, the main objective of this study is to develop a set of comprehensive mobile phone use indicators and problematic mobile phone use indicators. Second, this study seeks to examine and compare the extent of mobile phone use and problematic mobile phone use among

adolescents (13-17 years old) in Singapore and Malaysia. Third, this study aims to understand the mobile phone use and problematic mobile phone use among adolescents from three major perspectives – self, parents, and peers. Specifically, this study uses a theoretical modelling approach to determine the effects of adolescents' personality traits, parents' mobile phone use, parenting styles, parental mediation strategies, peer mediation, peer norms, and peer capital, on mobile phone use and problematic mobile phone use among adolescents.

Overview of Chapters

The following chapters in this dissertation proceed in the following sequences. Chapter Two provides an in-depth literature review of mobile phone use and problematic mobile phone use. Based on the theoretical and empirical literature reviewed, Chapter Two further proposes two research models examining factors predicting mobile phone use and problematic mobile phone use among adolescents from three perspectives – self, parents, and peers. The hypotheses and research questions are proposed to examine factors associated with mobile phone use and problematic mobile phone use.

Chapter Three reports the factors affecting mobile phone use and problematic mobile phone use among adolescent in Singapore and Malaysia. This chapter is divided into two parts. The first part reports the factors affecting mobile phone use and compares the extant of mobile phone use among adolescents in Singapore and Malaysia. Two hierarchical regressions and one t-test were conducted. The second part of this chapter reports the predictors of problematic mobile phone use and compares the extant of problematic mobile phone use among adolescents in Singapore and Malaysia. Likewise, two hierarchical regressions and one t-test were conducted. The results are reported and discussed.

Chapter Four discusses the theoretical and practical implications of this study, limitations, and suggestions for future research.

CHAPTER TWO LITERATURE REVIEW

Mobile Phone Use

The first mobile phone was invented by Martin Cooper and his colleagues in 1973 (Cooper, 2008). Since the invention, mobile phones have rapidly penetrated into our daily lives and have changed our lives dramatically (Katz & Aakhus, 2002). As mentioned in Chapter One Introduction, in addition to the call and SMS functions, the latest development of mobile phone enables users to engage in online activities, such as surfing social networking sites, playing online games, sending emails, and watching videos (Timmis et al., 2017). Given the multifunction of mobile phone, the definition of mobile phone use should not be limited to call and SMS functions, but should also include the online activities enabled by the latest features of mobile phone. Hence, this study defines mobile phone use as the intensity of using any functions of the latest mobile phone, such as calling, sending SMS, photo shooting, surfing Internet etc.

Studies showed that the use of mobile phone differ according to the personalities of each individuals (e.g., Sarah & Philips, 2008; Ehrenberg, et al., 2008; Lee, Tam, & Chie, 2014). For example, extroverted and neurotic people tend to have high frequency of mobile phone use, such as text messaging (Butt & Philips, 2008). Moreover, with the prevalence of wireless local area network (Wifi) and mobile phone data subscription, mobile phone users in this era prefer text messaging over voice-calling as most of the latest mobile applications consist of free text messaging as long as users are connected to the Internet. Studies also revealed that individuals with excessive mobile phone use tend to have high frequency of text messaging, especially those who started to use mobile phones at a younger age (Lu, et al., 2013).

Inyang and colleagues (2010) found the uptake of mobile phone started at a younger age. Indeed, adolescents are vulnerable to the negative consequences of

mobile phone use (Zulkefly & Baharudin, 2009). For instance, studies showed that text-messaging in classroom disrupted the learning process and affected students' academic performance (Froese, et al., 2012). Even more concerning is when young drivers like to talk on the phone while driving (Brusque & Alauset, 2008). These dangerous drivers are mostly young male drivers (Brusque & Alauset, 2008).

Although mobile phones bring about convenience in our daily lives, uncontrollable mobile phone use may lead to many negative, and sometimes fatal, consequences. In order to reduce the negative consequences of excessive mobile phone use, studies have been conducted to investigate the factors contributing to both mobile phone use and problematic mobile phone use (e.g. Butt & Philips, 2008; Ehrenberg, et al., 2008; Lee, Tam, & Chie, 2014; Beranuy et al., 2009; Bianchi & Phillips, 2005)

Problematic Mobile Phone Use

Different terms have been used to describe addictive tendencies of media use (Lee, Ho, and Lwin, 2017; Charlton et al., 2013) such as addiction, dependency, and problematic use. Existing mobile phone studies also used different terms to describe the addictive tendencies of mobile phone use, such as *mobile phone addiction* (Hong et al., 2012; Leung, 2008; Salehan & Negahban, 2013), *mobile phone involvement* (Walsh, White, Cox & Young, 2011), *mobile phone dependency* (Ezoe et al, 2009; Kawasaki et al., 2006; Sánchez-Martínez & Otero, 2009; Toda et al., 2006), and *problematic mobile phone use* (Billieux, 2015; Beranuy et al., 2009; Bianchi & Phillips, 2005; Martinotti et al., 2011; Merlo et al., 2013; Takao et al., 2009). *Mobile phone addiction* is defined as a kind of behavioural addiction such that one repetitively uses mobile phone to involve in behaviours that could affect individual's health (Chen et al., 2016). The concept of *mobile phone involvement* is proposed by Walsh and colleagues (2011). It is defined as the association of individuals' cognitive, such as

how much individuals think about their mobile phone when they are not using it; and individuals' behaviours, such as the frequency of checking their mobile phones (Walsh et al., 2011). Ezoe and colleagues (2009) defined *mobile phone dependence* based on two factors – the excessive use and the intermittent craving of mobile phone use. On the other hand, *problematic mobile phone use* is defined as “any pattern of mobile phone use resulting in subjective distress or impairment in important areas of functioning” (Merlo et al., 2013, p. 2).

Despite the differences in terminology, all the definition above addressed the same problem – problematic patterns of mobile phone use that could result in negative consequences. Lee and colleagues (2017) highlighted *addiction* as a highly disputable term that has a long academic tradition. It refers to the compulsive reliance on a habit or practise that resulted in negative mental or physical repercussions (Byun et al., 2009; Lee et al., 2017). Later, the term *addiction* was replaced with the term *dependency* in Diagnostic and Statistical Manual of Mental Disorder, Fourth Edition (DSM-IV) (LaRose et al., 2003; Lee et al., 2017; Merlo et al., 2013). However, *dependency* did not receive much acceptance due to conceptual confusion (Lee et al., 2017). Conversely, the term *problematic use* has become popular, especially among Internet researchers (Lee et al., 2017; Yellowlees & Marks, 2007). Many researchers prefer *problematic use* over *addiction* or *dependency* in the context of media technology, because it encompasses the compulsivity and negative outcomes of a habit or practise, but at the same time does not assume all problematic behaviours are pathological (Lee et al., 2017).

Indeed, previous study may have erroneously applied the term *addiction* or *dependency* in the media use context as it lacks clinical evidence to support that technological addiction is similar to other pre-existing psychiatric illness (Shapira et

al., 2003). *Addiction* and *dependency* are the terms often applied in the context of substance use, such as drug addiction and alcohol addiction, for which treatment is corollary. However, media addiction is not recognised as an established disorder due to issues such as etiology, comorbidity, and treatment (Ho et al., 2014; Lee et al., 2017; Merlo et al., 2013). Thus, it is excluded from the DSM-IV (Yellowlees & Marks, 2007). Moreover, there is a dearth of studies supporting definite behavioural and neurobiological similarities between mobile phone addiction and other existing addiction behaviours (Billieux, 2015). Moreover, mobile phone addiction has not been recognised as a diagnosable condition (Merlo et al., 2013). Therefore, this study suggests that *problematic use* would be a more appropriate term to use.

Problematic mobile phone use is defined as any patterns of mobile phone use that may resulted in negative consequences in daily life (Billieux et al., 2015; Merlo et al., 2013). Billieux and colleagues (2015) highlighted that problematic mobile phone use is a heterogeneous and multi-faceted condition. Many existing studies assumed problematic mobile phone use as an addictive behaviour without taking into consideration the different manifestation and psychological factors (Billieux, 2012). To address this concern, Billieux (2012) synthesised the existing studies on problematic mobile phone use and proposed a pathway model of problematic mobile phone use. Based on the findings of existing problematic mobile phone use studies, Billieux (2015) hypothesised that there are at least three non-mutually exclusive pathway that could lead to problematic mobile phone use, namely *excessive reassurance pathway*, *impulsive-antisocial pathway*, and *extraversion pathway*. These three pathways could lead to various manifestations of problematic mobile phone use, including addictive pattern of use, antisocial pattern of use, and risky pattern of use (Billieux, 2015).

In particular, excessive reassurance pathway corresponds to people whose problematic mobile phone use is due to the need to maintain relationships and to gain reassurance from others. Most of the people in the excessive reassurance pathway are affected by following factors, such as low self-esteem, neuroticism, emotional instability, insecure attachment, and anxiety. They often engaged in addictive pattern of mobile phone use, such as uncontrollable SMS use. Impulsive-antisocial pathway is corresponding to people whose problematic mobile phone use is driven by the uncontrollable urge and deregulated use. This group of people is lacking self-control, they have aggressive and antisocial personality. They often experience antisocial pattern of mobile phone use, such as using mobile phone in an inappropriate context or involved in cyberbullying. Extraversion pathway is driven by the desire to communicate and to build new relationships with others. People in this pathway are those who like to seek for sensation, they are extroverted, reward sensitive, and reward dependence. They often engaged in risky pattern of mobile phone use, phoning while driving or risky sexting. Figure 2.1 is the pathway model of problematic mobile phone use hypothesised by Billieux and colleagues (2015) based on the findings of existing literature.

Figure 2.1 A pathway model of problematic mobile phone use (adapted from Billieux et al., 2015)

Although the pathway model of problematic mobile phone use (Billieux, 2012) hypothesised three pathways that lead to problematic mobile phone use, all the pathways only focus on the individual factors without taking into account the influence of other socialization agents, such as parents and peers. The existing

parenting studies (Lau & Yuen, 2013; Patock-Peckham & Morgan-Lopez, 2006; Rosen, Cheever, & Carrier, 2008) showed that parenting styles and parental mediation have significant impacts on adolescents' problematic behaviours. Moreover, group socialization theory (Harris, 1995) also posits that peers exert significant influence on adolescents' behaviours. It is important to also examine parental and peer influence on adolescents' problematic mobile phone use. Therefore, in addition to individual factors, this study fills in the research gap by investigating problematic mobile phone use among adolescents from the parents and peer's perspectives.

Mobile Phone Use and Problematic Mobile Phone Use – Two Different Behaviours

Walsh and colleagues (2010) emphasized that mobile phone use and problematic mobile phone use are two different behaviours. Mobile phone use and problematic mobile phone use differs in terms of negative consequences of mobile phone use. In fact, heavy mobile phone users may not engage in any kind of problematic mobile phone use (Billieux, 2012; Walsh, 2011). Some people might have higher frequency of mobile phone use due to work obligations, but the high frequency of mobile phone use does not result in negative consequences (Merlo et al., 2013). Overuse of mobile phone does not necessarily lead to problematic mobile phone use (Hong, Chiu, & Huang, 2012). Merlo and colleagues (2013) argued that it is important to distinguish between the frequency of mobile phone use and problematic mobile phone use.

Problematic mobile phone use is not just an excessive use of mobile phone, but it includes one's maladaptive cognition and uncontrollable urge to use mobile phone when they are not using their mobile phone (Walsh, 2011). Problematic mobile phone users may engage in any patterns of mobile phone use that exceeded the threshold

disapproved by the society and regulations, which may result in negative consequences in daily life (Merlo et al., 2013). Furthermore, mobile phone use and problematic mobile phone use were affected by different factors (Walsh et al., 2011). For example, problematic mobile phone use was predicted by both self-identity and the validations of others, but intensity of mobile phone use was only predicted by self-identity (Walsh et al., 2010). Past studies also revealed extraversion was significantly related to problematic mobile phone use, but not mobile phone use. Therefore, it is important to differentiate between problematic use and high intensity of mobile phone use (Merlo et al., 2013).

On the other hand, only one research study was found to compare the problematic mobile phone use across countries (e.g. Kawasaki et al., 2006). This study also compared the problematic mobile phone use between high school students and university students in two countries, Thailand and Japan (Kawasaki et al., 2006). The findings showed that Thai university students have higher tendency of mobile phone dependency as compared to Thai high school students. Particularly, Thai female high school students have the highest mobile phone dependency as compared to other Thai and Japanese students (Kawasaki et al., 2006). However, the data in both countries were not collected simultaneously for comparison. Kawasaki and colleagues only collected the data in Thailand and compared their results with previous study conducted in Japan (e.g. Toda et al., 2004). Although problematic mobile phone use research has been conducted in some Asian countries, such as Hong Kong (Leung, 2008), Taiwan (Hong et al., 2012), and Japan (Takao et al., 2009), similar studies have not been conducted in Singapore and Malaysia. Given the fact that the mobile phone penetration rates among Singaporeans and Malaysians are increasing, it is worthwhile to investigate the potential factors affecting both mobile phone use and problematic

mobile phone use in both countries. Moreover, as mobile phone use and problematic mobile phone use are two different behaviours (Walsh et al., 2010), it would be interesting to compare and contrast the factors influencing mobile phone use and problematic mobile phone among adolescent in Singapore and Malaysia. This study serves as a pioneer piece to compare the intensity of mobile phone use and level of problematic mobile phone use among Singaporean and Malaysian adolescents by proposing the following research questions:

RQ1a: How is the intensity of mobile phone use different between Singaporean and Malaysian adolescents?

RQ1b: How is the level of problematic mobile phone use different between Singaporean and Malaysian adolescents?

Group Socialization Theory

Group socialization theory was proposed by Judith Harris (1995) to explain how the out-of-parental-home experiences shape one's *behavioural system*. Behavioural system is context-specific (Harris, 1995) and it refers to a pattern of behaviour, cognitions, and emotions that are experienced in or associated with the context. The main assumption of group socialization theory is that "socialization is highly context-dependent form of learning" (Harris, 1996, p. 462). Children learn and behave differently depending on the environment. Group socialization theory (Harris, 1995) posits that peer group has the most influence on children and adolescents' behavioural system, in addition to their generic effects (personality) and parental influences. Harris (1995; 2000) argued that parents do not have long term effects on adolescents' behaviour, as adolescents' behaviour differs according to the environment or context of socialization. Instead, peer group exerts a great influence on adolescents' behaviour in an out-of-home context as compared to their parents. In line with the

argument of group socialization theory, this study seeks to understand the effects of personality and the role of parents and peers on adolescents' mobile phone use and problematic mobile phone use. Specifically, this study aims to compare and contrast mobile phone use and problematic mobile phone use among adolescents in Singapore – a country that encourage mobile phone use in school for learning purposes, and Malaysia – a country that prohibit mobile phone use in school. Using group socialization theory as the overarching theoretical basis, the sections discuss adolescent's mobile phone use and problematic mobile phone use from three major perspectives: self, parents, and peers.

Self

Social Motives - Self-Esteem and Self-Control

According to Fiske (2010), social relationship building enables people to adapt to the environment and live with other people. From the social psychological perspective, Fiske (2010) proposed that there are five core social motives that encourage people to build relationship, including *belonging*, *understanding*, *controlling*, *self-enhancing*, and *trusting*. *Belonging* refers to the need to be part of a social group and the need to build close relationship with the group. It encompasses the self-presentation, social influence, and identity-related attitudes. The *understanding* motive helps people to adapt to a social group by making sense of what others do within the group. *Controlling* motivates people to be competent and effective when interacting with their environment. *Self-enhancing* and *trusting* are two affective motives. *Self-enhancing* explains the worthiness of oneself, such as self-esteem, self-improvement, and self-empathy (Fiske, 2010). *Trusting* motivates people to view the world in a positive way which in turn makes people more open adaptable to the interaction and the culture of a group.

Researchers found that self-esteem and self-control are two social motives that are most related to mobile phone behaviours (Walsh et al., 2011). Self-esteem derives from the self-enhancement motive. Self-enhancement motive describes human's need to view themselves as worthy or improvable (Fiske, 2010). Self-enhancement makes people feel good about themselves and are more willing to interact with people that are in line with their self-concept and view them favourably. This also implies that people with high self-esteem would feel good about themselves and are more motivated to improve themselves. They are more optimistic and willing to make effort to be part of a group.

Self-esteem

Self-esteem is a “social psychological concept that assesses individuals’ attitudes and perceptions of self-worth” (Stromberg & Westerlund, 2005, p. 13). In other words, self-esteem is the perceptions of individuals toward themselves on whether they are likeable or worthy (Billieux, 2012). It explains how people feel about themselves, whether they are likeable and worthwhile to other people. Leung (2008) stated that individuals with low self-esteem are less confident and they are less likely to communicate face-to-face with other individuals. This implies that they would seek other communication channels, which do not require physical interaction, to interact with people who are on line with their self-concept or with people who view them favourably (Fiske, 2010). They would contact their friends and peers, who they perceived to as positive evaluator, to gain reassurance from their friends and peers (Billieux, 2012; Fiske, 2010). However, the urge to seek self-worthiness and approval from peers among the low self-esteem people makes them more vulnerable to problematic behaviours. Fiske (2010) stated that people with low self-esteem tend to

feel rejected or excluded by other and involve in problematic behaviours, such as substance abuse, aggression, and eating disorder.

Fiske (2010) arguments were supported by past research studies, especially in the context of mobile phone use. Previous studies found that individuals with low self-esteem tend to experience problematic mobile phone use (Bianchi & Phillips, 2005; Leung, 2008). Likewise, a study conducted in Taiwan also revealed that self-esteem is negatively associated with mobile phone addiction (Hong, Chiu, & Huang, 2012). The study found that female students with low self-esteem tend to make more phone calls and send text messages more frequently (Hong, et al., 2012). The findings supported the arguments that low self-esteem people tend to seek reassurance from others who perceived them favourably, using a communication channel that does not require face-to-face interactions – mobile phone. Moreover, a study conducted in the context of South Korea also revealed that Korean adolescents with low self-esteem are more likely to use cellular phone use excessively (Ha, et al., 2008). Therefore, this study hypothesizes that adolescents with low self-esteem are more likely to have lower self-worth and prefer mobile phone communication than face-to-face communication. Low self-esteem people, who perceived being rejected or excluded by the social group, have the tendencies to engage in self-destructive behaviour, such as problematic mobile phone use.

H1a: Self-esteem is negatively associated with mobile phone use among adolescents.

H1b: Self-esteem is negatively associated with problematic mobile phone use among adolescents.

Self-control

On the other hand, self-control derives from the *controlling* motives.

Controlling motives refers to the need for perceived contingency between behaviour and outcomes (Fiske, 2010). It explains the relationship between the thing that people do and the subsequent outcomes. The need to control motives people to feel competent and effective to engage in their social activities. People who feel that they are always in control maybe happier and healthier (Fiske, 2010).

Self-control is defined as individuals' ability to resist, monitor, and adapt the attitudes, emotions, thinking, and desires in order to reach certain outcomes (Khang et al., 2012; Li et al., 2013). Unlike self-efficacy which is performance capabilities-focused, self-control is more on personal qualities (Zimmerman, 2000). It refers to the expectancies of the outcomes that are controlled by an internal behavioural force – a self-directed courses of action (Zimmerman, 2000). In this dissertation, self-control is a context-specific concept. It refers to adolescents' internal capability to monitor and control their intensity of mobile phone use and problematic behaviours when using mobile phone without the interventions of external forces. Self-control is often found associated with problematic behaviours, such as game addiction (Kim, Namkoong, Ku, & Kim, 2008), mobile phone addiction (Billieux, 2012; Cho, Kim, & Park, 2017; Khang et al., 2013; Khang et al., 2012), and problematic Internet use (Lee, 2013; Li et al., 2013).

Kim and colleagues (2008) found that self-control negatively predicted online game addiction. They found that Internet addiction among young people was due to the lack of self-control. Young people with low self-control have low ability to resist Internet use, thereby they are more vulnerable to Internet addiction. Likewise, in the context of mobile phone addiction, Khang and colleagues (2012) revealed that self-control is the most significant predictor of mobile phone addiction. Their findings

showed that individuals with high self-control are more capable to monitor and manage their mobile phone use. As such, they are less likely to experience problematic mobile phone use (Khang et al., 2013). Cho and colleagues (2017) also found self-control to be a factor reducing smartphone addiction. Given that people with high self-control are more effective and competent, it would be expected that they are more likely to monitor and control their frequency of mobile phone use. Therefore, they are also less likely to engage in problematic mobile phone use. Based on the above arguments, this study proposes the following hypotheses:

H2a: Self-control is negatively associated with mobile phone use among adolescents.

H2b: Self-control is negatively associated with problematic mobile phone use among adolescents.

Big Five Theory – Extraversion and Neuroticism

According to the Big Five Theory, there are five dimensions of a person's personalities which include extraversion, emotional stability (neuroticism), agreeableness, conscientiousness, and openness to experience (Barrick & Mount, 1991). An extraverted person is talkative, assertive, and energetic (John & Srivastava, 1999). People with agreeableness trait are those who are cooperative, trustful, and good-natured (John & Srivastava, 1999). Conscientiousness describes people who are dependable and responsible, while people with high emotional stability are people who is calm and not neurotic (John & Srivastava, 1999). Openness is used to describe imaginative and independent-minded people (John & Srivastava, 1999). However, after an intensive literature review, it is found that extraversion and neuroticism are most related to problematic mobile phone use (Demirhan, Randler, & Horzum, 2016; Roberts, Pullig, & Manolis, 2015).

Previous study found that extraversion and neuroticism predicted compulsive use of mobile social application, but found no significant relationship between agreeableness, conscientiousness, openness, and compulsive use of mobile social application (Hsiao, 2010). Similarly, Roberts and colleagues (2015) found that, among the five personality traits, only emotional stability (neuroticism) and introversion (opposite of extraversion) are associated with mobile phone addiction. Studies conducted in Japan (Takao, 2014) and Turkey (Demirhan et al., 2016) also showed that extraversion and neuroticism affected problematic mobile phone use, but not agreeableness, conscientiousness, and openness. Hsiao (2010) explained that although people with high agreeableness is kind and cooperative, but they may not like to use mobile phone to communicate with people. On the other hand, conscientious people would have more self-disciplinary and they are less likely to overuse mobile phone. They would use mobile phone for their tasks or relaxation, but they would not waste too much time on it (Hsiao, 2010). As for people with high openness, they are imaginative and willing to try new technology. Given that mobile phone becomes prevalent in Singapore and Malaysia since 2010s, it becomes less attractive to people with high openness because mobile phone may not satisfy their desire for new and exciting things (Hsiao, 2010). Therefore, this study only examines two of the Big Five Personalities – extraversion and neuroticism.

Extraversion

Extraversion is associated with mobile phone use and problematic mobile phone use (Bianchi & Phillips, 2005; Hong et al., 2012; Inyang, et al., 2008). According to John and Srivastava (1999), extraversion refers to “an energetic approach to the social and material world and includes traits such as sociability, activity, assertiveness, and positive emotionality” (p. 121). Scholars described that

extraverts like to socialize with other people, to have companion, and to have a higher baseline of positive affect as compared to introverts (Lee, Dean, & Jung, 2008).

Studies found that social extraversion has positive effects on mobile phone addiction in which individuals with high social extraversion are more likely to be addicted to mobile phones (Hong, et al., 2012). Likewise, there was a positive association between social extraversion and problematic mobile phone use (Bianchi and Philips, 2005).

Bianchi and Philips (2005) argued that extraverts are “fundamentally social in nature” (p. 47) while mobile phones are communication devices that facilitates the process of socialization. Mobile phone enables extraverts to look for social situations (Bianchi & Philips, 2005), and they would have more friends online (Hsiao, 2010). Subsequently, extraverts are more likely to use mobile phone to keep in touch with their friends which in turn they could be easily addicted to mobile phone.

Previous studies showed that extraversion is positively associated with problematic mobile phone use, especially problematic smartphone use (Cho et al, 2017; Hsiao, 2010; Demirhan, Randler, & Horzum, 2016). Therefore, the following hypotheses are proposed:

H3a: Social extraversion is positively associated with mobile phone use among adolescents.

H3b: Social extraversion is positively associated with problematic mobile phone use among adolescents.

Neuroticism

In addition to extraversion, neuroticism is also one of the personality traits proposed by the Big Five Theory. According to the theory, neuroticism refers to “negative emotionality, such as feeling anxious, nervous, sad, and tense” (John & Srivastava, 1999, p. 121). Neuroticism is also defined as individuals’ “level of

emotional stability and adjustment” (Ehrenberg et al., 2008, p. 739). Bianchi and Phillips (2005) described that neurotic people are emotional, anxious, worrying, moody, depressed, and often over react to stimuli. Neurotic people are more sensitive to other individuals’ response (Igarashi, et al., 2008) and they are also sensitive about relationships maintenance (Ezoe et al., 2009). Therefore, they might spend a longer time using mobile phones to reply text messages or to maintain their social networks in which might lead to problematic mobile phone use (Igarashi et al., 2008).

Past literature showed that neuroticism is associated with problematic behaviours, such as drug addiction (Gossop & Eysenck, 1980) and alcohol abuse (Ruiz, Pincus, & Dickinson, 2003). However, studies on the relationship between neuroticism and problematic mobile phone use are scant and the results are inconsistent. For instance, Bianchi and Philip (2005) found no association between problematic mobile phone and neuroticism. Yet, Ehrenberg and colleagues (2008) revealed that neurotic people tend to have high tendencies of mobile phone addiction. Ezoe et al. (2009) also found a significant relationship between neuroticism and mobile phone dependency among female college students in Japan. They found that neurotic students were more likely to experience problematic mobile phone use. Cho et al. (2018) found that increase in neuroticism could lead to higher tendencies of smartphone addiction. Due to the inconsistency of the findings, this study fills in the research gap by further exploring the relationship between neuroticism and problematic mobile phone use with the following hypotheses.

H4a: Neuroticism is positively associated with mobile phone use among adolescents.

H4b: Neuroticism is positively associated with problematic mobile phone use among adolescents.

Parents

The second perspective that this study focuses on is parents. The following sections reviews parental-related factors associated with problematic mobile phone use among adolescents. Specifically, the first part focuses on parents' mobile phone use, followed by the literature review of parenting styles, such as authoritarian, permissive, and authoritative parenting. The last part focuses on the literature review of parental mediation strategies, which includes active mediation, restrictive mediation, and mobile monitoring.

Parental Mobile Phone Use

Parents are the role model of their children, inferring that parents' mobile phone behaviours are more likely to be imitated by their children. According the social learning theory (Bandura, 1977), children learn to behave by observing the surrounding people, such as their parents and peers. Through observation, the child will consider the consequences of the behaviour when deciding whether or not to imitate such behaviour (McLeod, 2016). In line with this argument, it is expected that adolescents would imitate their parent's mobile phone behaviours if they perceive no negative consequences of such behaviour. In a study of environmental behaviours, Matthies and colleagues (2012) found that parental behaviour has a direct impact on their children's recycling behaviour. The impact of parental behaviour was attributed to the intrinsic motivation developed within the child during daily imitation.

Previous studies have shown that parental behaviours could influence adolescents' delinquency, such as drinking (e.g. Patock-Peckham, et al., 2001; Patock-Peckham & Morgan-Lopez, 2006; Jones, et al., 2008) and drug abuse (e.g. Yen, et al., 2007). Epstein (2012) found that that parents' computers use for pleasure affected children's non-school computer use (Epstein, 2012). Parents' time spent with

computer and engagement in Internet activities would influence teenagers' computer use (Vaala & Bleakley, 2015). Moreover, studies also found that when parental norms are inconsistent with the parental behaviours, such as 'what you say' is different from 'what you do', children are more likely to imitate their parents' behaviour rather than follow their instructions (Liu, et al., 2012). However, there is a paucity of research in examining the relationship between parental mobile phone use and adolescents' problematic mobile phone use.

In line with social learning theory (Bandura, 1977), this study proposes that adolescents would observe their parents' behaviours and imitate their pattern of mobile phone use given that parents are the role models of adolescents' daily life. It would be interesting to explore how the frequency of parental mobile phone use would affect the frequency of mobile phone use among adolescents. Therefore, this study proposes the following research question:

RQ2: How do parental mobile phone use influences mobile phone use among adolescents?

Parenting Styles

Problematic mobile phone use is a newly emerged issue in recent years, and the effects of parenting styles on problematic mobile phone use have not been extensively investigated. Many of the research on parenting styles and parental mediation strategies tend to focus on the context of Internet addiction and the risk of Internet use (Eklund & Helmersson Bergmark, 2013; Lee & Chae, 2012; Leung & Lee, 2012; Warren & Bluma, 2002; Yang et al., 2013). As problematic mobile phone use is comparable with other established addictions (Leung, 2008), it is worthwhile to examine the effects of parenting styles and parental mediation strategies on adolescents' mobile phone use and problematic mobile phone use. Mobile phone use

differs from Internet use in which mobile phone is a portable technology device which consists of many functions, such as voice calls, short message service (SMS), Global Positioning System (GPS), games, and also mobile web browsing. The Internet, on the other hand, is a computer network which can be accessed through technology device, such as computer, laptop, smartphone, and other miniature communication technologies. With the differences between mobile phone and the Internet, the effects of parenting styles and parental mediation both problematic mobile phone use and problematic Internet use might vary.

Parenting styles were first introduced by Baumrind (1967) to measure the effects of parents' behaviours on preschool children. Baumrind (1971) categorized parents' child-rearing behaviours into three categories, consisting of authoritarian parenting, permissive parenting, and authoritative parenting. Studies showed that authoritarian parents are more directive and required high obedience from their children without questioning (Patock-Peckham, et al., 2001; Yardi & Bruckman, 2011). They will use strict punishment to control their children. In contrast with authoritarian parents, permissive parents are less demanding but responsive, in which they allow their children to make their own decision and treat them like friends (Patock-Peckham, et al., 2001; Yardi & Bruckman, 2011). Permissive parents are unlikely to punish their children when their children commit a mistake. Authoritative parents have the most positive parenting style (Patock-Peckham & Morgan-Lopez, 2006) in which they would give clear direction for their children with reasonable explanation. Authoritative parenting style includes the advantages of both permissive and authoritarian parenting styles.

Many extant research on parenting styles focused on problematic behaviours, such as alcohol addiction (Patock-Peckham, et al., 2001; Patock-Peckham & Morgan-

Lopez, 2006) and online risky behaviours (Rosen, Cheever, & Carrier, 2008; Lau & Yuen, 2013), but not in the context of mobile phone use. Past research found that parenting styles, such as authoritarian, permissive, and authoritative, are associated with alcohol addiction (Patock-Peckham, et al., 2001; Patock-Peckham & Morgan-Lopez, 2006). For instance, Patock-Peckham and colleagues (2001) revealed that college students' behaviours were mostly affected by their parent of the same gender, inferring that female students are mostly influenced by their mother as compared to the male students. In contrast with female students, fathers have a stronger behavioural influence on male students as compared to mothers. Patock-Peckham and colleagues found that female students are most affected by authoritative mother pertaining to alcohol consumption. Moreover, studies showed that fathers who practice authoritative parenting style could prevent them from building a negative paternal bond with their children (Patock-Peckham & Morgan-Lopez, 2006). The close parent-child relationship could reduce the symptoms of depression and thus reduce alcohol-related problems among youths (Patock-Peckham & Morgan-Lopez, 2006). In the context of Internet research, studies found that students with problematic Internet use were likely to perceive their mother as less caring and both their parents as controlling (Yang et al., 2013). In contrast, parents who practiced encouragement parenting style could help to reduce adolescents' Internet stickiness (Lau & Yuen, 2013). However, scant study has investigated the effects of parenting styles in the context of mobile phone.

Therefore, this dissertation proposes the following research questions:

RQ3a: How do parenting styles influence mobile phone use among adolescents?

RQ3b: How do parenting styles influence problematic mobile phone use among adolescents?

Parental Mediation Strategies

Besides parenting styles, this study also examines the effects of parental mediation strategies on adolescents' problematic mobile phone by applying parental mediation theory. Lee (2013) stated that parental mediation is a parenting practice of children's media use. Darling and Steinberg (1993) argued that parenting practice differs from parenting style. Parenting style refers to how parents' attitudes are communicated to their children to create emotional climate, while parenting practice refers to parents' behaviours in helping their children to achieve certain social goals. In other words, parenting styles refers to the daily interaction between parents and children while parenting practice refers to parents' efforts in leading their children to achieve their targeted aims. Hence, in this study, parental mediation is defined as parenting practice implemented by parents in order to control adolescents' mobile phone use.

Parental mediation was first employed in the context of television mediation (Clark, 2011). Parental mediation theory assumes that parents use various interpersonal communication styles to protect their children from the negative impacts of media use (Clark, 2011). According to this theory, parental mediation can be divided into three categories: active mediation, restrictive mediation, and co-viewing (Clark, 2011; Leung & Lee, 2012; Livingstone & Helsper, 2008). Active mediation involves the discussion and conversation between parents and children regarding the use and content of technology media (Leung & Lee, 2012; Livingstone, 2008). Restrictive mediation refers to limit-setting or rules-making (Lee & Chae, 2012) mediation strategies in which parents set rules on the time, content of web, and games that can be played online (Leung & Lee, 2012; Livingstone, 2008). Co-viewing is an

act of having parents and children sitting together discussing and surfing the Internet (Lee & Chae, 2012; Leung & Lee, 2012).

Parental mediation theory has been largely applied in the research of Internet use. Previous literature revealed that parental mediation is associated with Internet addiction and Internet risk (e.g. Leung & Lee, 2012; Lee & Chae, 2012; Warren & Bluma, 2002). In examining the role of parents on digital gaming and Internet use, researchers found that mothers are more likely to use restrictive mediation parenting styles more than fathers (Eklund & Helmersson Bergmark, 2013). However, studies also found that restrictive mediation could reduce online risk but do not prevent Internet addiction (Lee, 2013). Surprisingly, Sasson and Mesch (2014) found that restrictive parental supervision could increase the online risk behaviours. The inconsistent results of previous studies strongly inferred that further study should be conducted in order to justify the effect of parental mediation on media use.

Clark (2011) argued that there is a research gap on how parental mediation can be applied in mobile media as most of the researchers have focused on other media contexts. Considering the mixed results of previous studies and research gaps, this study proposes to investigate the effects of parental mediation strategies on adolescents' problematic mobile phone use. However, this study only investigates the effects of active mediation and restrictive mediation on problematic mobile phone use. Co-viewing strategies were excluded in this study for the following reasons. First, co-viewing is not applicable in the context of mobile phone use as mobile phone is a device that is small in size. It is less practical for parents to co-view a mobile phone with their children as compared to television. Second, the co-viewing strategies might be applicable in the context of children or pre-teen, but not in the context of this study – adolescents' mobile phone use. Co-viewing a mobile phone requires parents and

adolescents sitting together looking at the same mobile phone for certain amount of time and discuss about the content they are watching. This is quite unlikely for adolescents, as they would expect more privacy as they become older (Hawk et al., 2009). Shin (2017) found that parents use active parental mediation to influence children's understanding of advertising on different media platforms, such as television, computer, and smartphone. Shin (2017) argued that parents who are concerned about the negative influences of media on children tend to engage in active parental mediation.

In addition to the two parental mediation strategies, this study employs a new parental mediation strategy - mobile monitoring. Monitoring was first introduced by Livingstone and Helsper (2008) in the context of Internet use. Monitoring refers to parents' attempts to check the websites and emails that their children have used (Livingstone & Helsper, 2008). Extending from Livingstone's research, this study defined mobile monitoring as checking children mobile phone overtly and covertly through mobile phone applications. Regular mobile phone checking, either overtly checking the call and text history or discreetly checking their usage through applications, enables parents to monitor their children's mobile phone use. Immediate actions can be taken when parents discover that their children are involved in problematic mobile phone use, and as such mobile monitoring will reduce the adolescents' tendency of experiencing problematic mobile phone use. Given that there is a lack of research focusing on the role of parental mediation in the mobile phone context, the following research questions are proposed:

RQ4a: How do parental mediation strategies influence mobile phone use among adolescents?

RQ4b: How do parental mediation strategies influence problematic mobile phone use among adolescents?

Despite the existing studies of the main effects of parental mediation, there is a paucity of literature on the moderating effects of parental mediation on media use. Scholars argued that the importance of parental mediation was not its direct effects on the media, but the indirect and long-term impacts which prevent children from negative consequences (Fisher et al., 2009). For example, studies found that adolescents who have high frequency of Internet use but good quality of communication with their parents about the risk and benefit of Internet use – active mediation – are able to overcome the potential effects of Internet use (Appel et al., 2012). In line with this argument, previous studies also showed that parental mediation could moderate the potential media influence (e.g. Fisher, et al., 2009; Chng, et al., 2015). Moreover, Chng and colleagues (2015) found that the effectiveness of parental mediation on pathology Internet use varies according to the level of support and warmth in the family. Extending this line of research, this study proposes that the effectiveness of parental mediation on mobile phone use and problematic mobile phone use may differ depending on the personalities of adolescents.

Furthermore, the findings of existing studies (e.g. Kalmus et al., 2015; Liu et al., 2016) suggested that the effects of parental mediation on adolescents' mobile phone use may varies across adolescents with different personalities or prior experience with mobile phone use. Hypothetically, restrictive parental mediation may effectively reduce the frequency of mobile phone use or problematic mobile phone use among neurotic adolescents, but it may not reduce the frequency of mobile phone or problematic mobile phone use among adolescents with high self-esteem. Given that every child may have different personality, parents may need to adopt different

parental mediation strategies to tackle the problematic mobile phone use of different child.

Previous studies revealed that parental mediation strategies moderated the relationship between personality and social media use (Liu, Ang, & Lwin, 2016). For example, a study exploring the influence of narcissism and parental mediation on adolescents' textual and visual personal information disclosure (Liu et al., 2016) found that parental mediation moderated the relationship between narcissism and visual information disclosure. In other words, narcissistic adolescents who are under low parental mediation are more likely to disclose their visual information on Facebook as compared to those who are under high parental mediation. The findings showed that parental mediation is important to counterbalance the effects of narcissism on adolescents' information disclosure. Parental mediation could reduce information disclosure among narcissistic adolescents (Liu et al., 2016). In addition, Kalmus and colleagues (2015) found that under high active parental mediation, adolescents who have negative experience on the Internet tend to have lower level of excessive Internet use (EIU). This implies that active parental mediation may effectively lower the excessive Internet use among adolescents who have negative experience on the Internet. Hence, it is important to examine the moderation effect of parental mediation strategies on the relationship between adolescents' personalities, mobile phone use, and problematic mobile phone use. This study proposes the following hypotheses:

H5: Restrictive mediation moderates the relationship between (a) self-esteem, (b) self-control, (c) extraversion, (d) neuroticism, and mobile phone use.

H6: Active mediation moderates the relationship between (a) self-esteem, (b) self-control, (c) extraversion, (d) neuroticism, and mobile phone use.

H7: Mobile monitoring moderates the relationship between (a) self-esteem, (b) self-control, (c) extraversion, (d) neuroticism, and mobile phone use.

H8: Restrictive mediation moderates the relationship between (a) self-esteem, (b) self-control, (c) extraversion, (d) neuroticism, and problematic mobile phone use.

H9: Active mediation moderates the relationship between (a) self-esteem, (b) self-control, (c) extraversion, (d) neuroticism, and problematic mobile phone use.

H10: Mobile monitoring moderates the relationship between (a) self-esteem, (b) self-control, (c) extraversion, (d) neuroticism, and problematic mobile phone use.

Peers

The Influence of Peer

In addition to parents, peers are important socialization agents during adolescence (Macionis, 2014; Nathanson, 2001). Despite spending time with parents at home, adolescents spend most of their time in school with their peers. In school, adolescents will have their own peer group – a social group with commonalities, such as age, social position, and interest (Macionis, 2014). Therefore, peer influence is one of the factors contributing to problematic behaviours among adolescents (Billieux, 2012). It refers to the general influences that peer exerted on adolescents. In fact, peer's relationship differs from parents-child relationship as adolescents might learn new skills from their peers in school that they might not learn from their parents (Nathanson, 2001). Adolescents are mostly influenced by the peer group they would like to join through an *anticipatory socialization* process, in which adolescents learn the attitudes and behaviours of that particular group so that they would be accepted by

the group. Youniss (1992) argued that the relationships between peers are symmetrical while the relationship between adolescents and their parents are unilateral. The interaction between adolescents is reciprocal in which one can act in a manner that his or her peer has acted. However, this interaction does not take place between parents and children.

Peer influence does not compete with parent-child's relationship. Instead, they are complementary (Youniss, 1992). Both peers and parents influence adolescents in different contexts (Harris, 1995). The group socialization theory (Harris, 1995) postulates that out-of-home socialization takes place among peer group. Harris (1995) argued that the personality of adolescents has two components – the genetic component and the environmental component which is context-specific. The environmental component is also termed as the *behavioural system* which refers to the behaviours, cognition, and emotions that are acquired and experienced in a particular social context (Harris, 1995). The group socialization theory attributed adolescents' behaviour to the influence of their peer group despite the parental influences (Harris, 2000). Group socialization theory indicated that peer influences should be accounted for adolescents' behaviour outside of the home context. Hence, it is necessary to understand how peer group influences mobile phone use and problematic mobile phone among adolescents, especially in a peer context.

Using group socialization as the theoretical framework, this dissertation focus on how peer mediation, social norm, and social capital could influence adolescents' mobile phone use and problematic mobile phone use. These three concepts differ from one another which encapsulates different aspects of adolescents' mobile phone use in their peer context. Peer mediation encompasses the interaction among adolescents via mobile phone use, such as the discussion about mobile phone use or the content

available on mobile phone. Social norm refers to the broader aspect, which is also the environment component. It is related to the overall norm of mobile phone use among the adolescents, especially in the peer context. On the other hand, social capital focuses on the relationships or social ties between adolescents, such as close friends or acquaintances. It would be worthwhile to understand which aspect of peer influences – the interaction, the norms, or relationship between adolescents – affect adolescents' mobile phone use.

Peer Mediation

Sullivan-Piaget thesis (Youniss, 1982) suggested that the role of peer becomes more important during adolescence. By referring to Sullivan-Piaget thesis and building on parental mediation theory, Nathanson (2001) proposed the concept of peer mediation in order to examine peer influence on antisocial television. Peer mediation refers to the interaction between peers that is related to a particular media. In contrast to parental mediation, peer mediation works differently on adolescents' behaviour (Shin & Lwin, 2017). Peers create certain norms and exert pressure among themselves regarding media use, but not executing rules and restrictions on each other as what parents could do. Peers are also less likely to check and monitor their peers' activities (Shin & Lwin, 2017). Therefore, restrictive mediation does not fit into peer mediation strategies (Nathanson, 2001). Instead, peers are more likely to engage in the neutral type of mediation, such as assisting and provide opinions, in which Shin and Lwin (2017) termed as active peer mediation. Shin and Lwin (2017) indicated that parental mediation and peer mediation differ in terms of the discussion content and therefore, the impacts of mediation may result in different directions. For example, parents may advise their children about the advantages and disadvantages of mobile phone use,

while peers could discuss about the content and the use of the mobile phone itself without exerting any rules and restrictions.

To examine the effects of peer mediation of antisocial television on adolescents' aggression, Nathanson (2001) divided peer mediation into two dimensions, namely peer discussion and co-view. Peer discussion refers to adolescents' discussion about the content of the media with their peers, while co-view refers to adolescents watching television with their peers. However, in the mobile communication context, co-viewing of mobile phone is less likely to occur due to the size of the mobile phone screen. Therefore, this study only proposes to examine the effects of peer discussion on adolescents' mobile phone use and problematic mobile phone use. Peer discussion of mobile phone use refers to communication between adolescents and their peers on mobile phone content and functions, such as the functions of mobile phone, the content of mobile social media, or the content of the mobile games, that could occur online or offline. For instance, adolescents could discuss about mobile phone games or any mobile phone content with their peers when they see each other in school. They could also discuss about mobile phone content with their peers using the mobile applications, such as Whatsapp and Facebook messenger, even without physically seeing each other.

Nathanson (2001) found that peer mediation was associated with the orientation towards problematic television and aggression (Nathanson, 2001). Peer discussion shapes adolescents' attitudes toward problematic television viewing, in which the more they discuss about the television content, the higher their tendency to watch violent or sexual television content. The study also revealed that the effect of peer mediation on aggression was stronger than parental mediation. Nathanson (2001) contended that parental mediation might reduce problematic behaviours, while peer mediation will increase problematic behaviour. Likewise, previous study also found that active peer

mediation predicted adolescents' engagement in online risks (Shin & Lwin, 2017). Shin and Lwin (2017) explained that peer comments may lead to adolescents being affected by the misperception that everyone within the peer group must engaged in these types of risky online behaviours. Subsequently, the more adolescents communicate with their peers about online risk, the higher the tendencies they will engage in risky online behaviours.

In line with this argument, this study posits that peer discussion on mobile phone content or functions may form a misperception among adolescents that their peer are heavy mobile phone users and they are also engaged in problematic mobile phone use. As such, adolescents may increase the frequency of their mobile phone use or further engage in problematic use as they would perceive that such behaviours are "common" among their peers. Hence, this study explores the effect of peer mediation by proposing the following hypotheses:

H11a: Peer mobile discussion is positively associated with mobile phone use among adolescents.

H11b: Peer mobile discussion is positively associated with problematic mobile phone use among adolescents.

Peer Norms

In addition to peer mediation, this study explores how peer norms could influence problematic mobile phone use by applying the social norms theory. Social norms theory was first proposed by Perkins and Berkowitz (1986) in the research of students' alcohol consumption. This theory posits that human behaviour is affected by the misperception of what other surrounding individuals perceive and do (Berkowitz, 2004). The social norms approach was utilized in many intervention and prevention efforts, especially in problematic behaviours (Berkowitz, 2004). This theory also

posits that social norms can be divided into descriptive and injunctive norms (Berkowitz, 2004; Sasson & Mesch, 2014). Descriptive norms refer to the misperception of what people actually do (Sasson & Mesch, 2014) while injunctive norms refer to the misperception that others are more permissive in certain behaviour (Perkin, 2002; Sasson & Mesch, 2014) or the misperception of what others feel is right to do (Berkowitz, 2004). Both descriptive and injunctive norms exert certain influences on adolescents' problematic mobile phone use (Baumgartner et al., 2011).

As this study focuses on peer norms on adolescents' problematic mobile phone use, descriptive norms is thus, defined as the misperception of what adolescents' peer actually do, while injunctive norms refer to the misperception that peers are more permissive of problematic behaviours related to mobile phone use. Specifically, Berkowitz (2003) contended that misperceptions, which are often overestimated, are usually related to problematic or risky behaviour. Previous studies on alcohol consumption indicated that students may overestimate their peers' alcohol consumption and fear that they will be left out of their peer groups if they do not do so (Perkins & Berkowitz, 1986; Rimal & Real, 2003). In line with the argument, this study proposes that adolescents may overestimate the intensity of mobile phone use among their peers and fear that they will be excluded from their peer groups if they do not use mobile phone. In addition to the overestimation of mobile phone use, this study also proposes that adolescents' problematic mobile phone use might be influenced by injunctive norms, in which they misperceive their peers' approval on problematic behaviours, such as using mobile phones in class and using mobile phones when it is time to do homework or when going to sleep. Adolescents may continue such problematic behaviours when they believe that their peers approve of these

behaviours. Therefore, the perceived descriptive norms and injunctive norms might be associated with higher tendency of problematic mobile phone use.

Most of the existing studies of peer norms are oriented toward alcohol-drinking behaviour (e.g., Clapp & McDonnell, 2000; Korcuska & Thombs, 2003) while a very small number focused on risky online behaviours (Baumgartner et al., 2011; Sasson & Mesch, 2014). For instance, Baumgartner and colleagues (2011) revealed that both descriptive and injunctive norms predicted adolescents' involvement in online sexual behaviours, in which descriptive norm was the stronger predictor. Sasson and Mesch (2014) also revealed that peer injunctive norm is positively associated with adolescents' risky online behaviour. Despite research in alcohol consumption and risky behaviour, few studies have investigated the effect of peer norms on mobile phone use and problematic mobile phone use. Therefore, this examines the effects of peer norms by proposing the following hypotheses:

H12a: Descriptive norm is positively associated with mobile phone use among adolescents.

H12b: Descriptive norm is positively associated with problematic mobile phone use among adolescents.

H13a: Injunctive norm is positively associated with mobile phone use among adolescents.

H13b: Injunctive norm is positively associated with problematic mobile phone use among adolescents.

Peer Capital

Group socialization theory postulates that peer plays a crucial role during adolescence (Harris, 1995; 2000). In line with the group socialization theory, this study seeks to understand how adolescents' social capital affected their mobile phone

use. Bourdieu (1986) defined social capital as “the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition” (p. 248). It has been widely applied in diverse research fields and is often related to different kinds of social problems, such as urban poverty and crime, economic underdevelopment, and inefficient government (Boix & Posner, 1998). Adler and Kwon (2002) suggested that social capital could also be widely applied to the study of families, schooling and education, youth behaviour problems, community life, public health, and problems of collective actions.

Later, social capital was further defined as “features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit” (Putnam, 1995, p.67). Putnam (1995) categorized social capital into bonding social capital (strong ties) and bridging social capital (weak ties). Bonding social capital is defined as the resources gained through the strong ties or close relationship between individuals, while bridging social capital refers to the resources gained through weak ties or loose relationships between individuals within a social network. Social capital is also widely applied in the context of communication technologies and attributed as the strength and qualities of individuals’ social relationships in their network (Yang, Kurnia & Smith, 2011).

Social capital also plays an important role during adolescence. Researchers have called for the inclusion of peer network in the studies of social capital due to the influence of peer on adolescents’ lives (Jørgensen, 2017). Being one of the important socialization agents, peer groups enabled adolescents to discuss matters that they might not share with their parents or teachers (Macionis, 2014). To prevent exclusion from a peer group, adolescents would spend a significant amount of time in

maintaining their peer relationships. Mobile phone, therefore, become a communication tool that facilitate the networking between adolescents. Given the argument above, this study proposes to investigate the role of peer social capital on adolescents' mobile phone use. In this dissertation, peer social capital is defined as the quality of relationships, such as close or loose ties, and the resources embedded in the relationships between adolescents and their peers (Skoval & Ogutu, 2012).

Walsh and White (2006) argued that social influence is crucial in determining adolescents' mobile phone use, as those with high intensity of mobile phone use tend to believe that mobile phone use is a normative behaviour and that it is acceptable among their social networks. Kavanaugh and colleagues (2005) found that people with larger social capital will have a better quality of life as compared with those with smaller social capital. Studies also revealed that individuals with larger bridging ties have higher community involvement, civic interest, and collective efficacy than those with lesser bridging social ties (Kavanaugh et al., 2005). Moreover, Internet users with larger bridging social capital tend to use the Internet for social purpose and thus leading to greater social engagement (Kavanaugh et al., 2005).

Similarly, adolescents with larger peer capital, either bonding or bridging peer capital, tend to engage in mobile phone use to ensure social inclusion and connectivity among their peers (Walsh et al., 2008). According to Ellison and colleagues (2007), social capital allows individuals to retrieve resources embedded in their social networks. Building on the concept of social capital, this study postulates that bonding peer capital is the strong ties or close relationship between adolescents and their peers, especially classmates, with whom they may gain information regarding homework or other school information. On the other hand, bridging peer capital is the loose ties between adolescents and peers. Bridging peer capital process of maintaining a loose

relationship with their peers (Putnam, 1995), such as their seniors or juniors, with whom they may gain extra information regarding their study. Therefore, the larger peer capital adolescents possess, the greater the amount of time they spent in maintaining their peer capital, which might thus lead to greater mobile phone use.

Miyata and Kobayashi (2008) revealed that the types of Internet usage are associated with different social networks. The study showed that the larger the social capital individuals possess, the higher the intensity of personal computer email use. Particularly, the more supportive social ties individuals possess, the higher the tendency of mobile phone email use. Moreover, Boase and Kobayashi (2008) found that mobile phone email is used for both bonding and bridging social capital but not to break their social ties. They also found that Japanese adolescents use mobile phone email to bridge social ties more intensively as compared with bonding social ties. Given that peer is an important socialization agent in an out-of-home context as suggested by group socialization theory, this dissertation seeks to narrow down the social capital of adolescents by understanding the impacts of peer social capital, or peer capital, on adolescents' mobile phone use.

Social capital could be a double-edged sword in which it fosters social inclusion and connectivity among adolescents (Walsh et al, 2008), but it is also associated with different types of social problems (Boix & Posner, 1998). Few studies have investigated the effects of peer capital on mobile phone use. For example, Leung (2008) found that social capital is significantly associated with mobile phone addiction. He posited that the larger the social capital individuals possess, the more likely they will be addicted to mobile phones (Leung, 2008). Specifically, peer capital benefits the adolescents as they could seek helps from their peer capital when they need certain resources, information, advises, or even monetary assistance. However,

adolescents with large peer capital would need significant amount of time to maintain their peer capital. Given that smartphone use is prevalence among adolescents in Singapore (IMDA, 2015) and Malaysia (2014), it is expected that adolescents would spent time using mobile phone to maintain their peer capital. They may spend time calling and texting their peers, or interacting with their peers on mobile social media. They may also response to peer that require their assistance in homework or other personal matters. This implies that the adolescents with large peer capital may have high frequency of mobile phone use. Subsequently, they are vulnerable to problematic mobile phone use (Leung, 2007). Existing research also showed that social capital is associated with mobile phone addiction (Leung, 2008), computer and mobile phone email use (Boase & Kobayashi, 2008; Miyata & Kobayashi, 2008), and Facebook use (Ellison et al., 2007; Steinfield, Ellison, & Lampe, 2008). Considering the results of previous studies, this study proposes the following hypotheses:

H14a: Bonding peer capital is positively associated with mobile phone use among adolescents.

H14b: Bonding peer capital is positively associated with problematic mobile phone use among adolescents.

H15a: Bridging peer capital is positively associated with mobile phone use among adolescents.

H15b: Bridging peer capital is positively associated with problematic mobile phone use among adolescents.

Demographic Factors

Previous studies have shown that age and gender are associated with problematic mobile phone use (Bianchi & Philips, 2005; Takao, Takashi & Kitamura, 2009; Walsh, White, Cox & Young, 2011; Augner & Hacker, 2012). Younger people

tend to use mobile phone more frequently than older people as the latter are less likely to adopt new technologies (Brickfield, 1984; Charness & Bosman, 1992). Due to this reason, younger people are more likely to experience problematic mobile phone use (Bianchi & Philips, 2005). Bianchi and Philips (2005) found that young female extraverts, who have low self-esteem, are more likely to experience problematic mobile phone use than those with higher self-esteem. Walsh and colleagues (2011) also found that younger females with high self-identity and in-group norm have higher level of mobile phone involvement – the cognitive and behavioural engagement with mobile phone use. Augner and Hacker (2012) also found that young people are more likely to experience problematic mobile phone use. Besides age, gender is found to be associated with problematic mobile phone use. Sánchez-Martínez and Otero (2009) pointed out that male students tend to use new technologies to explore and play games while female students tend to use new technologies to communicate with other individuals. In their study, they found that female adolescents are more likely to own a mobile phone and use it more frequently than male adolescents (Sánchez-Martínez & Otero, 2009). Toda et al. (2006) found that females prefer indirect communication, such as the use of Internet service, while males are more likely to use voice phone services. Takao and colleagues (2009) found that females with high self-monitor and high approval monitor are more likely to experience mobile phone addiction. Similarly, Beranuy et al. (2009) found that females experience more negative impacts of maladaptive mobile phone use and are more vulnerable to psychological distress than males. In this study, demographic variables, such as age and gender, are included as control variables.

Research Models

This study proposes to examine the following research models (see Figure 2.2 and Figure 2.3). Particularly, drawing on group socialization theory, this study examines the effects of self (i.e., personality traits), parents (i.e., parents' mobile phone use, parenting styles, and parental mediation), and peers (i.e., peer mediation, peer norms, and peer capital) on adolescents' mobile phone use and problematic mobile phone use. Demographic characteristics, such as age, gender, and race are controlled in this study.

Figure 2.2. Research Model 1

Figure 2.3 Research Model 2

CHAPTER THREE

COMPARISON OF MOBILE PHONE USE AND PROBLEMATIC MOBILE PHONE USE AMONG ADOLESCENTS IN SINGAPORE AND MALAYSIA

Hypotheses and Research Questions

The main objective of Chapter 3 is to examine the impact of personality traits, parental influence, and peers influence on adolescents' mobile phone use and problematic mobile phone use. Specifically, this chapter aims to test the following hypotheses and research questions that were proposed in Chapter 2:

H1a: Self-esteem is negatively associated with mobile phone use among adolescents.

H1b: Self-esteem is negatively associated with problematic mobile phone use among adolescents.

H2a: Self-control is negatively associated with mobile phone use among adolescents.

H2b: Self-control is negatively associated with problematic mobile phone use among adolescents.

H3a: Social extraversion is positively associated with mobile phone use among adolescents.

H3b: Social extraversion is positively associated with problematic mobile phone use among adolescents.

H4a: Neuroticism is positively associated with mobile phone use among adolescents.

H4b: Neuroticism is positively associated with problematic mobile phone use among adolescents.

H5: Restrictive mediation moderates the relationship between (a) self-esteem, (b) self-control, (c) extraversion, (d) neuroticism, and mobile phone use.

H6: Active mediation moderates the relationship between (a) self-esteem, (b) self-control, (c) extraversion, (d) neuroticism, and mobile phone use.

H7: Mobile monitoring moderates the relationship between (a) self-esteem, (b) self-control, (c) extraversion, (d) neuroticism, and mobile phone use.

H8: Restrictive mediation moderates the relationship between (a) self-esteem, (b) self-control, (c) extraversion, (d) neuroticism, and problematic mobile phone use.

H9: Active mediation moderates the relationship between (a) self-esteem, (b) self-control, (c) extraversion, (d) neuroticism, and problematic mobile phone use.

H10: Mobile monitoring moderates the relationship between (a) self-esteem, (b) self-control, (c) extraversion, (d) neuroticism, and problematic mobile phone use.

H11a: Peer mobile discussion is positively associated with mobile phone use among adolescents.

H11b: Peer mobile discussion is positively associated with problematic mobile phone use among adolescents.

H12a: Descriptive norm is positively associated with mobile phone use among adolescents.

H12b: Descriptive norm is positively associated with problematic mobile phone use among adolescents.

H13a: Injunctive norm is positively associated with mobile phone use among adolescents.

H13b: Injunctive norm is positively associated with problematic mobile phone use among adolescents.

H14a: Bonding peer capital is positively associated with mobile phone use among adolescents.

H14b: Bonding peer capital is positively associated with problematic mobile phone use among adolescents.

H15a: Bridging peer capital is positively associated with mobile phone use among adolescents.

H15b: Bridging peer capital is positively associated with problematic mobile phone use among adolescents.

RQ1a: How is the intensity of mobile phone use different between Singaporean and Malaysian adolescents?

RQ1b: How is the level of problematic mobile phone use different between Singaporean and Malaysian adolescents?

RQ2: How do parental mobile phone use influences problematic mobile phone use among adolescents?

RQ3a: How do parenting styles influence mobile phone use among adolescents?

RQ3b: How do parenting styles influence problematic mobile phone use among adolescents?

RQ4a: How do parental mediation strategies influence mobile phone use among adolescents?

RQ4b: How do parental mediation strategies influence problematic mobile phone use among adolescents?

This chapter begins with the method section, followed by the result of the data analyses. The result section is divided into two parts. The first part focuses on the comparison of mobile phone use between adolescents in Singapore and Malaysia. The second part highlights the comparison of problematic phone use between adolescents in Singapore and Malaysia.

Method

Data

Data Collection in Singapore

Both Nanyang Technological University (NTU) Institutional Review Board (IRB) and Singapore's Ministry of Education (MOE) approval were sought prior to the data collection. The data collection progress began after receiving the approval from the both NTU IRB and MOE. Singapore's data was collected using a self-administered questionnaire. The survey was conducted with four secondary schools in Singapore. These participating schools were chosen using convenience sampling¹. A total of 735 Singaporean adolescents aged 13 to 17 years old participated in this study. They were secondary school's students ranging from Secondary 1 to Secondary 5². For each school, 10 classes were selected to participate in this study. Each of these 10 classes represents Singaporean students in Secondary 1, 2, 3, 4, and 5. Parental consents were obtained prior to the survey. Before administering the survey, students were informed of the purpose of the study and that they can exit the study at any time without penalty. They were assured that their responses would be kept confidential.

Data Collection in Malaysia

¹ Initially, multi-stage cluster sampling method was used to randomly select four secondary schools in Singapore (one each from the North, South, East, and West regions). However, due to the low response from secondary schools, multi-stage cluster sampling method was replaced by convenience sampling.

² The Singapore education system of Secondary 1 is equivalent to the American education system of Grade 7.

Similarly, Malaysia's data was also collected using a self-administered questionnaire. The data was collected from four secondary schools in Penang, Malaysia. These schools were invited using convenience sampling method³. A total of 735 Malaysian adolescents aged between 13 to 18 years old took part in this study. They are secondary school students in Malaysia ranging from Form 1 to Form 5⁴. Ten classes were selected from each school to participate in this study. Each of these 10 classes will represent Malaysian students in Form 1, 2, 3, 4, and 5. Parental consents were obtained prior to the survey. Before administering the survey, students were informed of the purpose of the study and that they can exit the study at any time without penalty. They were assured that their responses would be kept confidential.

Measures

Demographic variables. Demographic variables were used as control variables in this study. These control variables include age (Singapore: $M = 14.83$, $SD = 1.53$; Malaysia: $M = 16.39$, $SD = 1.11$), gender (1 = male, 0 = female; Singapore: 49.70%; Malaysia: 54.60% female), and race (1= Chinese, 0 = Others; Singapore: 79.30% Chinese; Malaysia: 68.8% Chinese).

Dependent Variables

Mobile phone use. Adolescents' mobile phone use was measured using 3 items adapted from previous study (Walsh et al., 2010) in a 5-point Likert scale, ranging from 1 (never) to 5 (always). These items include: (1) "How often do you make/receive mobile phone calls in a week?" (2) "How often you send/receive text messages in a week?" and (3) "How often do you surf mobile social media in a week?" All the items were averaged to create a composite index, with higher scores

³ The survey in Malaysia was conducted after Singapore's survey. To ensure that both data are comparable, convenience sampling method was used according to the data collection method in Singapore.

⁴ The Malaysia education system of Form 1 is equivalent to the Singapore education system of Secondary 1.

indicating higher frequency of mobile phone use (Singapore: $M = 3.63$, $SD = .82$, Cronbach's $\alpha = .70$; Malaysia: $M = 3.29$, $SD = .84$, Cronbach's $\alpha = .62$).

Problematic mobile phone use. Problematic mobile phone use was measured using 22 items adapted from the Problematic Use of Mobile Phone scale developed by Merlo et al. (2013). Respondents were asked to rate these items using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). These items are: (1) "When I reduce the amount of time spent using my mobile phone I feel less satisfied"; (2) "I need more time using my mobile phone to feel satisfied than I used to need"; (3) "When I stop using my mobile phone, I get moody and irritable"; (4) "It would be very difficult, emotionally, to give up my mobile phone"; (5) "The amount of time I spend using my mobile phone keeps me from doing other important work"; (6) "I have thought in the past that it is not normal to spend as much time using a mobile as I do"; (7) "I think I might be spending too much time using my mobile phone"; (8) "People tell me I spend too much time using my mobile phone"; (9) "When I am not using my mobile phone, I am thinking about using it or planning the next time I can use it"; (10) "I feel anxious if I have not received a call or message in some time"; (11) "I have ignored the people I'm with in order to use my mobile phone"; (12) "I have used my mobile phone when I knew I should be doing schoolwork"; (13) "I have used my mobile phone when I knew I should be sleeping"; (14) "When I stop using my mobile phone because it is interfering with my life, I usually return to it"; (15) "I have gotten into trouble at work or school because of my mobile phone use"; (16) "At times, I find myself using my mobile phone instead of spending time with people who are important to me and want to spend time with me"; (17) "I have used my mobile phone when I knew it was dangerous to do so"; (18) "I have almost caused an accident because of my mobile phone use"; (19) "My mobile phone use has caused me

problems in a relationship”; and (20) “I have continued to use my mobile phone even when someone asked me to stop. All the items were averaged to create a composite index, with higher scores indicating higher problematic mobile phone use (Singapore: $M = 2.64$, $SD = .61$, Cronbach’s $\alpha = .89$; Malaysia: $M = 2.81$, $SD = .54$, Cronbach’s $\alpha = .87$).

Independent Variables

Self-esteem. Self-esteem was measured using 5 items adapted from the Rosenberg self-esteem scale in a 5-point Likert scale, ranging from 1 (strong disagree) to 5 (strongly agree). Examples of these items are: (1) “I feel that I am a person of worth, at least on an equal plane with others”; (2) “I feel that I have a number of good qualities”; (3) “I am able to do things as well as most other people”; (4) “I have a positive attitude toward myself”; (5) “On the whole, I am satisfied with myself. These items were averaged to create a composite index, with higher scores indicating higher self-esteem (Singapore: $M = 3.38$, $SD = .63$, Cronbach’s $\alpha = .84$; Malaysia: $M = 3.40$, $SD = .59$, Cronbach’s $\alpha = .69$).

Self-control. Self-control was measured using 6 items adapted from the Brief Self-Control scale (Tangney, Baumeister, and Boone, 2004). Respondents were required to rate these items on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Examples of these items are: (1) “I have a hard time breaking bad habits”; (2) “I say inappropriate things”; (3) “I do certain things that are bad for me, if they are fun”. (4) “I have trouble concentrating”; (5) “Sometimes I can’t stop myself from doing something, even if I know it is wrong”; and (6) “I often act without thinking through all the alternatives”. These items were averaged to create a composite index, with higher scores indicating higher self-control (Singapore: $M =$

2.96, $SD = .53$, Cronbach's $\alpha = .72$; Malaysia: $M = 3.06$, $SD = .58$, Cronbach's $\alpha = .64$).

Extraversion. Extraversion was measured using 11 items adapted from the Revised Eysenck Personality Questionnaire (EPQR-S) by (Francis, Lewis, and Ziebertz, 2006). Respondents were required to rate these items in a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). These items are: (1) "I am a talkative person"; (2) "I am rather lively"; (3) "I enjoy meeting new people"; (4) "I usually let myself go and enjoy myself at a lively party"; (5) "I usually take the initiative in making new friends"; (6) "I can easily get some life into a boring party"; (7) "I like mixing with people"; (8) "I like plenty of bustle and excitement around me"; (9) "I am mostly quiet when I am with other people"; (10) "Other people think that I am very lively"; and (11) "I can make a party lively". All items were averaged to create a composite index, with higher scores indicating higher extraversion (Singapore: $M = 3.37$, $SD = .62$, Cronbach's $\alpha = .86$; Malaysia: $M = 3.34$, $SD = .52$, Cronbach's $\alpha = .75$).

Neuroticism. Neuroticism was measured using 12 items adapted from the Revised Eysenck Personality Questionnaire (EPQR-S) by Francis et al. (2006). Respondents were asked to rate these items in a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). These items are: (1) "My mood often goes up and down"; (2) "I feel 'miserable' for no reason"; (3) "I am an irritable person"; (4) "My feelings are easily hurt"; (5) "I often feel 'fed-up'"; (6) "I will call myself a nervous person"; (7) "I often feel worried"; (8) "I will call myself tense or 'highly strung'"; (9) "I worry too long after an embarrassing experience"; (10) "I suffer from anxiety"; (11) "I often feel lonely"; and (12) "I am often troubled by the feelings of guilt". All items were averaged to create a composite index, with higher scores

indicating higher neuroticism (Singapore: $M = 2.91$, $SD = .75$, Cronbach's $\alpha = .90$; Malaysia: $M = 3.04$, $SD = .61$, Cronbach's $\alpha = .85$).

Parents' mobile phone use. Parents' mobile phone use was measured using 6 items in a 5-point Likert scale, ranging from 1 (never) to 5 (always). These items include: (1) "How often do your parent (whom you are closer to) make/receive mobile phone calls?" (2) "How often do your parent (whom you are closer to) send/receive text messages?" (3) "How often do your parent (whom you are closer to) play mobile games?" (4) "How often do your parent (whom you are closer to) use mobile applications?" (5) "How often do your parent (whom you are closer to) surf mobile social media?" and (6) "How often do your parent (whom you are closer to) surf mobile web?" All items were averaged to create a composite index, with higher scores indicating higher frequency of parents' mobile phone use (Singapore: $M = 3.17$, $SD = .80$, Cronbach's $\alpha = .81$; Malaysia: $M = 3.04$, $SD = .75$, Cronbach's $\alpha = .77$).

Authoritarian. Authoritarian parenting style was measured using 10 items according to the CFA results in Chapter 3. These items were adapted from the Parental Authority Questionnaire (Buri, 1991). Respondents were required to rate these items on a 5-point Likert scale, ranging from 1 (strong disagree) to 5 (strongly agree). The 10 items are: (1) "My parents felt that it is good for me to conform to what they thought was right, even if I don't agree with them"; (2) "Whenever my parents told me to do something, they expected me to do it immediately without asking any questions"; (3) "knew what my parents expected of me in the family and they insisted that I conform to those expectations simply out of respect for their authority; (4) "My parents did not allow me to question any decision they had made"; (5) "My parents felt that more force should be used by parents in order to get their children to behave the way they are supposed to"; (6) "My parents felt that wise parents should teach their

children early just who is leader in the family”; (7) “My parents would get very upset if I tried to disagree with them”; (8) “My parents let me know what behaviour they expected of me, and if I didn’t meet those expectations, they punished me”; (9) “My parents felt that most problems in society would be solved if parents could strictly and forcibly deal with their children when they don’t do what they are supposed to”; and (10) “My parents often told me exactly what they wanted me to do and how they expected me to do it”. All items were averaged to create a composite index, with higher scores indicating greater authoritarian parenting (Singapore: $M = 2.83$, $SD = .77$, Cronbach’s $\alpha = .90$; Malaysia: $M = 2.94$ $SD = .55$, Cronbach’s $\alpha = .81$).

Permissive. Permissive parenting style was measured using 10 items adapted from Parental Authority Questionnaire (Buri, 1991). Respondents were asked to rate these item on a 5-point Likert scale, ranging from 1 (strong disagree) to 5 (strongly agree). These items include: (1) “My parents felt that children should have their way in the family as often as the parents do”; (2) “My parents always felt that what children need is to be free to make up their own minds and to do what they want to do, even if their parents might not agree”; (3) “My parents did not feel that I needed to obey rules and regulations of behaviour simply because someone in authority had established them”; (4) “My parents often did what the children in the family wanted when making family decisions”; (5) “My parents feel that most problems in society would be solved if parents do not restrict their children’s activities, decisions, and desires”; and (6) “My parents allowed me to decide most things for myself without a lot of directions from them”; (7) “My parents seldom gave me expectations and guidelines for my behaviour”; (8) “My parents did not view themselves as responsible for directing and guiding my behaviour”; (9) “My parents allowed me to form my own point of view on family matters and to decide for myself what I was going to do”; (10) “My parents did

not direct the behaviours, activities, and desires of the children in the family”. All items were averaged to create a composite index, with higher scores indicating greater permissive parenting (Singapore: $M = 2.88$, $SD = .63$, Cronbach’s $\alpha = .86$; Malaysia: $M = 3.01$, $SD = .46$, Cronbach’s $\alpha = .74$).

Authoritative. Authoritative parenting style was measured using 10 items adapted from the Parental Authority Questionnaire (Buri, 1991). Respondents were asked to rate these items on a 5-point Likert scale, ranging from 1 (strong disagree) to 5 (strongly agree). Following are the items: (1) “Once family rules had been established, my parents discussed the reasons behind the policy with me”; (2) “I knew what my parents expected of me, but I am free to discuss those expectations with them”; (3) “If my parents made a decision in the family that hurt me, they were willing to discuss with me and to admit it if they had made a mistake”; (4) “My parents always encouraged verbal give-and-take whenever I felt that family rules and restrictions were unreasonable”; (5) “My parents directed the activities and decisions of the children in the family through reasoning and discipline”; (6) “My parents consistently gave me direction and guidance in rational and objective ways”; (7) “My parents took my opinions into consideration when making family decisions, but they would not decide for something simply because I wanted it”; (8) “My parents had clear standards of behaviour for the children in our home, but they are willing to adjust those standards to the needs of each individual children”; (9) “My parents gave me directions for my behaviour and activities and they expected me to follow their direction, but they are willing to listen to my concerns and to discuss that directions with me”; and (10) “My parents gave me directions for my behaviour and activities but they also understood when I disagreed with them”. These items were averaged to create a composite index,

with higher scores indicating greater authoritative parenting (Singapore: $M = 3.26$, $SD = .71$, Cronbach's $\alpha = .92$; Malaysia: $M = 3.17$, $SD = .54$, Cronbach's $\alpha = .84$).

Restrictive mediation. Restrictive mediation was measured using 4 items. Respondents were required to rate these items on a 5-point Likert scale, ranging from 1 (never) to 5 (always). These items are: (1) "How often do your parents limit the type of mobile games that you can play?" (2) "How often do your parents limit the type of mobile applications that you can use?" (3) "How often do your parents limit the type of mobile social media that you can use?" and (4) "How often do your parents limit the type of mobile web that you can surf?" All items were averaged to create a composite index, with higher scores indicating greater restrictive mediation (Singapore: $M = 2.02$, $SD = 1.04$, Cronbach's $\alpha = .94$; Malaysia: $M = 2.46$, $SD = 1.03$, Cronbach's $\alpha = .90$).

Active mediation. Active mediation was measured using 5 items. Respondents were asked to rate these items on a 5-point Likert scale, ranging from 1 (never) to 5 (always). These items are: (1) "How often do your parents talk to you about advantages or disadvantages of mobile phone use?" (2) "How often do your parents talk to you about advantages or disadvantages of mobile game?" (3) "How often do your parents talk to you about advantages or disadvantages of mobile applications use?" (4) "How often do your parents talk to you about advantages or disadvantages of mobile Internet use?" and (5) "How often do your parents talk to you about advantages or disadvantages of mobile social media use?" These items were averaged to create a composite index, with higher scores indicating greater active mediation (Singapore: $M = 2.56$, $SD = 1.05$, Cronbach's $\alpha = .94$; Malaysia: $M = 2.88$, $SD = .94$, Cronbach's $\alpha = .90$).

Mobile monitoring. Mobile monitoring was measured using 5 items based on the CFA results in Chapter Three. Respondents were asked to rate the items on a 5-point Likert scale, ranging from 1 (never) to 5 (always). These items include: (1) “How often do your parents check your mobile phone?” (2) “How often do your parents monitor the last login of your mobile applications, such as Whatsapp, Facebook messenger and etc.?” (3) “How often do your parents check the mobile games that you play?” (4) “How often do your parents check your mobile web history?” and (5) “How often do your parents monitor or track your mobile social media, such as Facebook, Instagram, Twitter and etc”. All items were averaged to create a composite index, with higher scores indicating greater mobile monitoring (Singapore: $M = 1.69$, $SD = .90$, Cronbach’s $\alpha = .92$; Malaysia: $M = 2.07$, $SD = .99$, Cronbach’s $\alpha = .91$).

Peer discussion. Peer discussion was measured by using 3 items adapted from previous study (Nathanson, 2001). These items were rate on a 5-point Likert scale, ranging from 1 (strong disagree) to 5 (strongly agree). These items are: (1) “My friends and I often discuss about mobile phone”; (2) “My friends and I often discuss about mobile games”; and (3) “My friends and I often discuss about mobile social media”. These items were averaged to create a composite index, with higher scores indicating higher peer discussion (Singapore: $M = 2.98$, $SD = .90$, Cronbach’s $\alpha = .65$; Malaysia: $M = 3.08$, $SD = .95$, Cronbach’s $\alpha = .71$).

Descriptive norm. Descriptive norm was measured using 8 items adapted from previous study (Baumgartner et al., 2011). Respondents were required to rate these items on a 5-point Likert scale, ranging from 0 (no one) to 5 (nearly all of my peers). These items are: (1) “How many of your peers use their mobile phone in class?” (2) “How many of your peers spend too much time using their mobile phone?”

(3) “How many of your peers use their mobile phone while they should be doing their homework?” (4) “How many of your peers ignore the people they are with in order to use their mobile phone?” (5) “How many of your peers use their mobile phone when they should be sleeping?” (6) “How many of your peers almost caused an accident due to their mobile phone use?” (7) “How many of your peers got into trouble in school due to their mobile phone use?” and (8) “How many of your peers’ mobile phone use has caused them problems in relationships?” All the items were averaged to create a composite index, with higher scores indicating greater descriptive norm (Singapore: $M = 2.89$, $SD = .72$, Cronbach’s $\alpha = .84$; Malaysia: $M = 2.47$, $SD = .79$, Cronbach’s $\alpha = .85$).

Injunctive norm. Injunctive norm was measured using 8 items adapted from previous study (Baumgartner et al., 2011). Respondents were asked to indicate the level of their peers’ acceptability on their mobile phone behaviours using a 5-point Likert scales, ranging from 1 (not acceptable at all) to 5 (very acceptable). These items are: (1) “What do your peers think of you when you use your mobile phone in class?” (2) “What do your peers think of you when you spend too much time using your mobile phone?” (3) “What do your peers think of you when you use your mobile phone while you should be doing your homework?” (4) “What do your peers think of you when you ignore the people you are with in order to use your mobile phone?” (5) “What do your peers think of you when you use your mobile phone when you should be sleeping?” (6) “What do your peers think of you when you almost caused an accident due to your mobile phone use?” (7) “What do your peers think of you when you got into trouble in school due to your mobile phone use?” and (8) “What do your peers think of you when your mobile phone use has caused you problems in relationships?” These items were averaged to create a composite index, with higher

scores indicating greater injunctive norm (Singapore: $M = 2.44$, $SD = .67$, Cronbach's $\alpha = .81$; Malaysia: $M = 2.50$, $SD = .67$, Cronbach's $\alpha = .75$).

Bonding peer capital. Bonding peer capital was measured using 10 items adapted from the Bonding Subscale by Williams (2006). These items are rated on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The 10 items are: (1) "There are several peers I trust to help to solve my problems"; (2) "I can turn to my peers for advice about making very important decisions"; (3) "There is no one that I feel comfortable talking to about intimate personal problems"; (4) "When I feel lonely, there are several peers I can talk to"; (5) "If I needed an emergency loan of \$50, I know some peers I can turn to"; (6) "I do not know people well enough to get them to do anything important"; (7) "The peers I interact with would put their reputation on the line for me"; (8) "The peers I interact with would be good resources for my homework"; (9) "The peers I interact with would share their last dollar with me"; and (10) "The peers I interact with would help me fight an injustice". These items were averaged to create a composite index, with higher scores indicating higher bonding peer capital (Singapore: $M = 3.53$, $SD = .65$, Cronbach's $\alpha = .83$; Malaysia: $M = 3.26$, $SD = .54$, Cronbach's $\alpha = .72$).

Bridging peer capital. Bridging peer capital was measured using 10 items adapted from the Bridging Subscale (William, 2006). Respondents were required to rate these items on a 5-point Likert scales ranging from 1 (Strongly disagree) to 5 (Strongly agree). These items include: (1) "Interacting with my peers make me interested in things that happen outside of my town"; (2) "Interacting my peers make me want to try new things"; (3) "Interacting my peers make me interested in what people unlike me are thinking"; (4) "Interacting with my peers makes me curious about other places in the world"; (5) "Interacting with my peers makes me feel like

part of a larger community”; (6) “Interacting with my peers makes me feel isolated”; (7) “Interacting with my peers reminds me that everyone in the world is connected”; (8) “Interacting with my peers allows me to talk to new people”; (9) “I am willing to spend time to support my peers’ general activities”; and (10) “Through mobile phone, I come in contact with new people all the time”. These items were averaged to create a composite index, with higher scores indicating higher bridging peer capital (Singapore: $M = 3.71$, $SD = .61$, Cronbach’s $\alpha = .86$; Malaysia: $M = 3.39$, $SD = .51$, Cronbach’s $\alpha = .74$).

Table 4.1 and Table 4.2 summarize the mean, standard deviation, and reliability of dependent and independent variables. Table 4.3 summarizes the Correlation between independent variables and dependent variables.

Table 4.1. Summary of mean and standard deviation of dependent and independent variables.

	Singapore		Malaysia	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<i>Dependent variables</i>				
Mobile phone use	3.63	.82	3.29	.84
Problematic mobile phone use	2.64	.61	2.81	.54
<i>Independent variables</i>				
Self-esteem	3.38	.63	3.40	.59
Self-control	2.96	.53	3.06	.58
Extraversion	3.37	.62	3.34	.52
Neuroticism	2.91	.75	3.04	.61
Parent's mobile phone use	3.17	.80	3.04	.75
Authoritarian parenting	2.83	.77	2.94	.55
Permissive parenting	2.88	.63	3.01	.46
Authoritative parenting	3.26	.71	3.17	.54
Restrictive mediation	2.02	1.04	2.46	1.03
Active mediation	2.56	1.05	2.88	.94
Mobile monitoring	1.69	.90	2.07	.99
Peer discussion	2.98	.90	3.08	.95
Descriptive norms	2.89	.72	2.47	.79
Injunctive norms	2.44	.67	2.50	.67
Bonding peer capital	3.53	.65	3.26	.54
Bridging peer capital	3.71	.61	3.39	.51

Note: For reference, items appear in this table in the same order as in the Methods section.

Table 4.2. Reliability of the dependent and independent variables.

	No of items		Cronbach alpha's value	
	<i>SG</i>	<i>MY</i>	<i>SG</i>	<i>MY</i>
<i>Dependent variables</i>				
Mobile phone use	3	3	0.70	0.62
Problematic mobile phone use	20	20	0.89	0.87
<i>Independent variables</i>				
Self-esteem	5	5	0.84	0.69
Self-control	6	6	0.72	0.64
Extraversion	11	11	0.86	0.75
Neuroticism	12	12	0.90	0.85
Parent's mobile phone use	6	6	0.81	0.77
Authoritarian parenting	10	10	0.90	0.81
Permissive parenting	10	10	0.86	0.74
Authoritative parenting	10	10	0.92	0.84
Restrictive mediation	4	4	0.94	0.90
Active mediation	5	5	0.94	0.90
Mobile monitoring	5	5	0.92	0.91
Peer discussion	3	3	0.65	0.71
Descriptive norms	8	8	0.84	0.85
Injunctive norms	8	8	0.81	0.75
Bonding peer capital	10	10	0.83	0.72
Bridging peer capital	10	10	0.86	0.74

Note: For reference, items appear in this table in the same order as in the Methods section.

Table 4.3. Correlation between independent variables and dependent variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Self-esteem	-	.41***	-.07	.03	.11**	.27***	-.02	.11**	-.05	.04	-.07	.01	.26***	.20***	.19***	-.08*
2. Extraversion		-	-.10**	.02	.18**	.21***	-.06	.10**	-.07	.18***	.00	.07	.32***	.35***	.28***	.01
3. Neuroticism			-	.15***	.04	.06	-.02	-.00	-.03	.01	.18***	.17***	.02	.07	.09*	.27***
4. Authoritarian				-	.33***	.22***	.20***	.26***	.25***	.06	.10*	.10**	.09*	.09*	.06	.29***
5. Permissive					-	.34***	.07*	.20***	.09*	.12**	.05	.07*	.26***	.27***	.12**	.13***
6. Authoritative						-	.03	.23***	.01	.08*	-.02	.08*	.35***	.36***	.13**	.03
7. Restrictive mediation							-	.36***	.50***	.17***	.19***	.14***	-.01	-.18***	.10**	.24***
8. Active mediation								-	.35***	.10**	-.02	.09*	.11**	.04	.09*	.14***
9. Mobile monitoring									-	.05	.09*	.06	-.08*	-.21***	-.02	.21***
10. Peer discussion										-	.30***	.24***	.10**	.07	.39***	.34***
11. Injunctive norms											-	.51***	.09*	.11**	.29***	.54***
12. Descriptive norms												-	.11**	.11**	.26***	.40***
13. Bonding peer capital													-	.58***	.27***	.06
14. Bridging peer capital														-	.25***	.11**
15. Mobile phone use															-	.26***
16. Problematic mobile phone use																-

Analytic Approach

Four ordinary least squares (OLS) hierarchical regression analyses were conducted to test the hypotheses and research questions. For the first OLS hierarchical regression analysis on mobile phone use, all the independent variables were entered into the regression blocks according to their assumed causal order as follow:

1. The control variables (demographic variables – age, gender, and race)
2. Personality variables (self-esteem, self-control, extraversion, and neuroticism)
3. Parents variables (parent's mobile phone use, authoritarian parenting, permissive parenting, authoritative parenting, restrictive mediation, active mediation, and mobile monitoring)
4. Peer variables (peer discussion, descriptive norms, injunctive norms, bonding peer capital, and bridging peer capital)

For the second OLS hierarchical regression analysis on problematic mobile phone use, all the independent variables were entered into the regression blocks according to their assumed causal order as below⁵:

1. The control variables (demographic variables – age, gender, and race)
2. Personality variables (self-esteem, self-control, extraversion, and neuroticism)
3. Parents variables (authoritarian parenting, permissive parenting, authoritative parenting, restrictive mediation, active mediation, and mobile monitoring)
4. Peer variables (adolescents' mobile phone use, peer discussion, descriptive norms, injunctive norms, bonding peer capital, and bridging peer capital)

For the first and second regression models, 12 two-way interactions were included in the last block. The main effect variables were standardized before the

⁵ All the variables tested in second regression model are equivalent to those tested in first regression model, with the exception of the exclusion of parents' mobile phone use variable.

interaction terms were created in order to avoid the multicollinearity problems between the interaction terms and their components (Cohen and Cohen, 1983).

The third and fourth OLS hierarchical regression analysis were conducted to compare the intensity of mobile phone use and problematic mobile phone use between Singapore and Malaysia. All the independent variables were entered into the first regression block, and treated as controlled variables. The variable – country – was included in the second regression block as below:

1. The control variables (personality variables, parents variables, and peer variables)
2. Country (1=Singapore, 0=Malaysia)

Results

Part 1 Comparison of Mobile Phone Use between Adolescents in Singapore and Malaysia

Demographic

Table 4.4 demonstrated the final models predicting adolescents' mobile phone use in two countries – Singapore and Malaysia. Across two countries, the demographic block accounted for smaller variance in predicting mobile phone use among adolescents (Singapore: 3.20%; Malaysia: 3.30%). Age was significantly associated with mobile phone use in Malaysia ($\beta = .07, p < .05$), but not significantly associated with mobile phone use in Singapore. Gender was a significant and negative predictor of mobile phone use in Singapore ($\beta = -.19, p < .001$) and Malaysia ($\beta = -.17, p < .01$). Girls have higher frequency of mobile phone use in Singapore. Contrary to gender, race was not associated with mobile phone use in Singapore. Contrary to gender, race was not associated with mobile phone use in Singapore. Adversely, the results showed

that other races (i.e. Malays, Indians, and Others) have higher frequency of mobile phone use in Malaysia as compared to the Chinese baseline group ($\beta = -.09, p < .01$).

Self

For personality variables, self-esteem was negatively associated with mobile phone use in Singapore ($\beta = -.08, p < .01$), but not significantly related to mobile phone use in Malaysia. Hence, H1a was partially supported. Self-control were not significantly associated with mobile phone use in Singapore and Malaysia, H2a was not supported. Extraversion, on the other hand, was positively associated with mobile phone use in both Singapore ($\beta = .15, p < .001$) and Malaysia ($\beta = .13, p < .01$). H3a was supported. Neuroticism not significantly associated with mobile phone use in Singapore and Malaysia. Therefore, H4a was not supported. This block accounted for 8.80% of the variance in the dependent variable in Singapore and 10.40% of the variance of the same dependent variable in Malaysia.

Parents

To answer RQ2 to RQ5, parental variables were included in block 3. The results show that parent's mobile phone use was positively associated with adolescents' mobile phone use in both Singapore ($\beta = .17, p < .001$) and Malaysia ($\beta = .16, p < .001$). Authoritarian parenting was negatively significantly associated with mobile phone use in Singapore ($\beta = -.11, p < .01$), but not significantly related to mobile phone use in Malaysia. Permissive and authoritarian parenting were not associated with mobile phone use in both countries. Likewise, in response to RQ4a, all the parental mediation variables were not significantly associated with mobile phone in Singapore and Malaysia. This accounted for lesser variance in predicting mobile phone use in Singapore (6.70%) and Malaysia (7.60%).

Peers

For peer variables, peer discussion was positively associated with mobile phone use in both Singapore ($\beta = .14, p < .001$) and Malaysia ($\beta = .27, p < .001$). H5a was supported. Descriptive norms was positively associated with mobile phone use in Singapore ($\beta = .08, p < .05$), but not related to mobile phone use in Malaysia. H6a was partially supported. As predicted in the hypothesis, injunctive norms was positively associated with mobile phone use in Singapore ($\beta = .15, p < .001$) and Malaysia ($\beta = .13, p < .01$). H7a was supported. In Singapore, bonding peer capital was not significantly associated with mobile phone use. However, bonding peer capital was positively associated with mobile phone use in Malaysia ($\beta = .13, p < .01$). Therefore, H8a was partially supported. Contrary to bonding peer capital, bridging peer capital was positively associated with mobile phone use in Singapore ($\beta = .15, p < .001$), but not related to mobile phone use in Malaysia. Thus, H9a is partially supported. The peers block accounted for the largest variance in predicting mobile phone use among adolescent in Singapore (13.50%) and Malaysia (12.00%).

Moderation Effects

Next, to answer RQ5a, this study examined whether parental mediation of adolescents' mobile phone use would moderate the relationships between personality traits and mobile phone use. The result showed that restrictive mediation moderated the relationship between extraversion and mobile phone use in Singapore ($\beta = .07, p < .05$), but not in Malaysia. As shown in Figure 4.1, high restrictive mediation has stronger impact on mobile phone use among adolescents with low extraversion score as compared to adolescents who score high on extraversion. Among Singaporean adolescents with low extraversion, those who experienced high restrictive mediation would have lower frequency of mobile phone use. In contrast, among Singaporean

with high extraversion, those who experienced high restrictive mediation would have higher frequency of mobile phone use.

The results also revealed that active mediation moderated the relationship between extraversion and mobile phone use in Singapore ($\beta = .08, p < .05$), but not in Malaysia. As shown in Figure 4.2, the impact of active mediation on mobile phone use was greater for Singaporean adolescents with low extraversion. Among adolescents with low extraversion, those who experienced high active mediation would have lower frequency of mobile phone use as compared to those who experienced low active mediation. Likewise, the results also showed that mobile monitoring moderated the relationship between extraversion and mobile phone use in Malaysia ($\beta = .07, p < .05$), but not in Singapore. Figure 4.3 revealed that the impact of mobile monitoring was stronger among adolescents with low self-esteem. Among adolescents with low self-esteem, those who experienced high mobile monitoring would have lower frequency of mobile phone use as compared to those who experienced low mobile phone monitoring. The interaction block accounted for a very small amount of variance in predicting mobile phone use in Singapore (1.70%) and Malaysia (1.70%).

Intensity of mobile phone use between Singapore and Malaysia

For the intensity of mobile phone use between Singapore and Malaysia (RQ1a), the results showed that country was a significant predictor of mobile phone use ($\beta = .27, p < .001$). Singaporean adolescents have higher intensity of mobile phone use as compared to Malaysian adolescents. The result of the regression analyses was depicted in Table 4.5.

Table 4.4. Comparison of Mobile Phone Use among Singaporean and Malaysian.

	<i>Singapore</i>	VIF	<i>Malaysia</i>	VIF
Block 1: Demographics				
Age	-.06	1.16	.07*	1.13
Gender (1=Male; 0=Female)	-.19***	1.19	-.07*	1.18
Race (1=Chinese; 0=Others)	-.05	1.09	-.16***	1.26
Incremental R^2 (%)	3.20***		3.30***	
Block 2: Self				
Self-esteem	-.08*	1.68	.05	1.40
Self-control	.04	1.45	-.03	1.39
Extraversion	.15***	1.41	.13**	1.40
Neuroticism	-.01	1.60	.04	1.31
Incremental R^2 (%)	8.80***		10.40***	
Block 3: Parents				
Parent's mobile phone use	.17***	1.11	.16***	1.21
Authoritarian parenting	-.11**	1.37	-.04	1.27
Permissive parenting	.01	1.32	.02	1.35
Authoritative parenting	.03	1.35	-.06	1.41
Restrictive mediation	.01	1.67	.04	1.56
Active mediation	-.03	1.51	.01	1.36
Mobile monitoring	.04	1.52	-.04	1.53
Incremental R^2 (%)	6.70***		7.60***	
Block 4: Peers				
Peer discussion	.14***	1.23	.27***	1.33
Descriptive norms	.08*	1.27	.07	1.60
Injunctive norms	.15***	1.26	.13**	1.44
Bonding peer capital	.05	1.75	.13**	1.66
Bridging peer capital	.15***	1.80	-.03	1.88
Incremental R^2 (%)	13.50***		12.00***	
Block 5: Interactions				
Self-esteem*Restrictive mediation	.02		.04	
Self-esteem*Active mediation	-.01		.01	
Self-esteem*Mobile monitoring	-.01		.07*	
Self-control*Restrictive mediation	.04		.04	
Self-control*Active mediation	.01		.03	
Self-control*Mobile monitoring	.00		-.04	
Extraversion*Restrictive mediation	.07*		.05	
Extraversion*Active mediation	.08*		.04	
Extraversion*Mobile monitoring	.05		.06	
Neuroticism*Restrictive mediation	.05		.00	
Neuroticism*Active mediation	.05		-.04	
Neuroticism*Mobile monitoring	.04		.01	
Incremental R^2 (%)	1.70		1.70	
Total R^2 (%)	42.00***		35.00***	

Note: Singapore: $N=738$; Malaysia: $N=735$. Cell entries for all models are final standardized regression coefficients for Blocks 1, 2, 3, and 4, and before-entry standardized regression coefficient for Block 5.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Figure 4.1. Interaction effect of restrictive mediation and extraversion on Singaporean adolescents' mobile phone use.

Figure 4.2. Interaction effect of active mediation and extraversion on Singaporean adolescents' mobile phone use.

Figure 4.3. Interaction effect of mobile monitoring and self-esteem on Malaysian adolescents' mobile phone use.

Table 4.5. Mobile Phone Use Comparison between Singapore and Malaysia

	<i>Mobile Phone Use</i>
Block 1	
Age	.01
Gender (1=Male; 0=Female)	-.17***
Race (1=Chinese; 0=Others)	-.05*
Self-esteem	-.00
Self-control	.02
Extraversion	.14***
Neuroticism	.03
Parent's mobile phone use	.15***
Authoritarian parenting	-.07**
Permissive parenting	.00
Authoritative parenting	.01
Restrictive mediation	.01
Active mediation	.00
Mobile monitoring	.02
Peer discussion	.27***
Descriptive norms	.08**
Injunctive norms	.14***
Bonding peer capital	.09**
Bridging peer capital	.09**
Incremental R^2 (%)	30.70***
Block 2	
Country (1=Singapore, 0=Malaysia)	.27***
Incremental R^2 (%)	2.30
Total R^2 (%)	33.00***

Note: $N=1473$. Cell entries for all models are final standardized regression coefficients.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Part 2 Comparison of Problematic Mobile Phone Use between Adolescents in

Singapore and Malaysia

Demographic

Table 4.6 showed the final models predicting adolescents' problematic mobile phone use in both Singapore and Malaysia. The demographic block accounted for smaller variance in predicting mobile phone use among adolescents for both countries (Singapore: 0.10%; Malaysia: 2.10%). Age was not significantly related to problematic mobile phone use in Singapore and Malaysia. Gender was negatively associated with problematic mobile phone use in Singapore ($\beta = -.12$, $p < .001$), but

not associated with problematic mobile phone use in Malaysia. The results showed that Singaporean girls have higher level of problematic mobile phone use. Race was not a significant predictor of problematic mobile phone use in both Singapore and Malaysia.

Self

For the self-variables, this study found that self-esteem is not a significant predictor of problematic mobile phone use in Singapore and Malaysia. Thus, H1b was not supported. As predicted in H2b, self-control was negatively associated with problematic mobile phone use in Singapore ($\beta = -.34, p < .001$) and Malaysia ($\beta = -.18, p < .001$). Hence, H2b was supported. On the other hand, extraversion was not significantly associated with problematic mobile phone use in both Singapore and Malaysia. H3b was rejected. However, neuroticism was positively associated with problematic mobile phone use in Singapore ($\beta = .08, p < .05$) and Malaysia ($\beta = .10, p < .01$), supporting H4b. This block accounted for the largest variance in predicting problematic mobile phone use in Singapore (23.70%) and Malaysia (18.80%).

Table 4.6. Comparison of Problematic Mobile Phone Use among Singaporean and Malaysian

	<i>Singapore</i>	VIF	<i>Malaysia</i>	VIF
Block 1: Demographics				
Age	-.01	1.16	.05	1.11
Gender (1=Male; 0=Female)	-.12***	1.19	.06	1.18
Race (1=Chinese; 0=Others)	.01	1.09	.02	1.25
Incremental R^2 (%)	0.10		2.10**	
Block 2: Self				
Self-esteem	.00	1.67	-.04	1.39
Self-control	-.34***	1.45	-.18***	1.40
Extraversion	.01	1.41	-.01	1.31
Neuroticism	.08*	1.59	.10**	1.38
Incremental R^2 (%)	23.70***		18.80***	
Block 3: Parents				
Authoritarian parenting	.06	1.36	.16***	1.27
Permissive parenting	.02	1.31	-.00	1.35
Authoritative parenting	-.00	1.35	-.05	1.41
Restrictive mediation	.14***	1.67	.05	1.54
Active mediation	.08*	1.51	.04	1.35
Mobile monitoring	.02	1.51	.12**	1.52
Incremental R^2 (%)	7.60***		10.20***	
Block 4: Peers				
Peer discussion	.18***	1.21	.15***	1.29
Descriptive norms	.06	1.27	.10**	1.60
Injunctive norms	.18***	1.26	.33***	1.44
Bonding peer capital	-.03	1.74	-.04	1.65
Bridging peer capital	-.01	1.80	.10**	1.84
Incremental R^2 (%)	8.10***		17.40***	
Block 5: Interaction				
Self-esteem*Restrictive mediation	.03		.02	
Self-esteem*Active mediation	.04		.03	
Self-esteem*Mobile monitoring	-.01		.00	
Self-control*Restrictive mediation	.04		.00	
Self-control* Active mediation	-.04		.00	
Self-control* Mobile monitoring	-.02		-.03	
Extraversion*Restrictive mediation	.01		.03	
Extraversion*Active mediation	-.02		-.00	
Extraversion*Mobile monitoring	.00		.02	
Neuroticism*Restrictive mediation	.03		-.07*	
Neuroticism*Active mediation	.04		-.07*	
Neuroticism*Mobile monitoring	.01		-.04	
Incremental R^2 (%)	2.10*		1.10	
Total R^2 (%)	41.70***		47.10***	

Note: Singapore: $N=738$; Malaysia: $N=735$. Cell entries for all models are final standardized regression coefficients for Blocks 1, 2, 3, and 4, and before-entry standardized regression coefficient for Block 5.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Figure 4.6. Interaction effect of restrictive mediation and neuroticism on Malaysian adolescents' problematic mobile phone use.

Figure 4.7. Interaction effect of active mediation and neuroticism on Malaysian adolescents' problematic mobile phone use.

Parents

To answer RQ3b and RQ4b, parents-related variables were entered into the third block of the regression model. The results revealed that authoritarian parenting was positively associated with problematic mobile phone use Malaysia ($\beta = .16, p < .001$), but not in Singapore. Permissive parenting was not significantly associated with problematic mobile phone use in both Singapore and Malaysia. Authoritative parenting was not significantly associated with problematic mobile phone use in Singapore and Malaysia. Restrictive mediation was positive associated with problematic mobile phone use in Singapore ($\beta = .14, p < .001$), but not in Malaysia. Similarly, active mediation was positive associated with problematic mobile phone use in Singapore ($\beta = .08, p < .05$), but not in Malaysia. Yet, mobile monitoring was positively associated with problematic mobile phone use in Malaysia ($\beta = .12, p < .01$), but not in Singapore. This block accounted for lesser variance in predicting problematic mobile phone use in both Singapore (7.60%) and Malaysia (10.20%).

Peers

For peer variables, peer discussion was positively associated with problematic mobile phone use in Singapore ($\beta = .18, p < .001$) and Malaysia ($\beta = .15, p < .001$). Hence, H5b was supported. Descriptive norms was not significantly related to problematic mobile phone use in Singapore, but it was positively associated with problematic mobile phone use in Malaysia ($\beta = .10, p < .01$). Therefore, H6b was partially supported. Injunctive norms was a significant and positive predictor of problematic mobile phone use in Singapore ($\beta = .18, p < .001$) and Malaysia ($\beta = .33, p < .001$). Therefore, H7b was supported. Contrary to the proposed hypothesis, bonding peer capital was not significantly related to problematic mobile phone use in both countries. Therefore, H8b was not supported. Interestingly, bridging was not

significantly associated with problematic mobile phone use in Singapore, but positively associated with problematic mobile phone use in Malaysia ($\beta = .10, p < .01$). Thus, H9b was partially supported. This block accounted different variance in predicting problematic mobile phone use in Singapore (8.10%) and Malaysia (17.40%).

Moderation Effects

In addition, to answer RQ5b, this study tested whether parental mediation would moderate the relationships between personality traits and problematic mobile phone use. The result showed that restrictive mediation moderated the relationship between neuroticism and problematic mobile phone use in Malaysia ($\beta = -.07, p < .05$), but not in Singapore. Figure 4.6 shows that among adolescents with low neuroticism, low restrictive mediation is effective in reducing problematic mobile phone use among Malaysian adolescents. Among adolescents with high neuroticism, high restrictive mediation is more effective in reducing problematic mobile phone use.

Moreover, Figure 4.7 shows that low active mediation could reduce problematic mobile phone use among Malaysian adolescents with low neuroticism. On the other hand, high active mediation is effective in reducing problematic mobile phone use among Malaysian adolescents with high neuroticism.

Intensity of problematic mobile phone use between Singapore and Malaysia

For the intensity of problematic mobile phone use between Singapore and Malaysia (RQ1b), the results showed that country was not significantly associated with problematic mobile phone use. There was no significant difference in terms of intensity of problematic mobile phone use between Singapore adolescents and Malaysian adolescents. The result of the regression analyses was depicted in Table 4.7.

Table 4.7. Problematic Mobile Phone Use Comparison between Singapore and Malaysia

	<i>Mobile Phone Use</i>
Block 1	
Age	.01
Gender (1=Male; 0=Female)	-.11***
Race (1=Chinese; 0=Others)	-.02
Self-esteem	-.03
Self-control	-.27***
Extraversion	.00
Neuroticism	.08**
Authoritarian parenting	-.08***
Permissive parenting	-.01
Authoritative parenting	-.02
Restrictive mediation	.09**
Active mediation	.07**
Mobile monitoring	.09***
Peer discussion	.17***
Descriptive norms	.08**
Injunctive norms	.25***
Bonding peer capital	-.04
Bridging peer capital	.03
Incremental R^2 (%)	41.90***
Block 2	
Country (1=Singapore, 0=Malaysia)	.01
Incremental R^2 (%)	.00
Total R^2 (%)	41.90***

Note: $N=1473$. Cell entries for all models are final standardized regression coefficients.

* $p < .05$. ** $p < .01$. *** $p < .001$.

CHAPTER FOUR DISCUSSION AND CONCLUSION

Discussions

Overall, this study examines factors contributing to mobile phone use and problematic mobile phone use among adolescents in Singapore and Malaysia. The primary contribution of this study is the preliminary investigation of mobile phone use and problematic mobile phone use from the three major perspectives – self, parents, and peers. Consistent with group socialization theory (Harris, 1995), the findings show that peers exerted significant influence on adolescents' mobile phone use. Conversely, the individual factors – self – exerted substantial impacts on adolescents' problematic mobile phone use. The findings of this study could inform parents and educators to practise appropriate mediation strategies to reduce the tendencies of problematic mobile phone use among adolescents. These findings also enable the policymakers to devise appropriate policies pertaining to mobile phone use in school.

Intensity of Mobile Phone Use and Problematic Mobile Phone Use – Comparison between Singapore and Malaysia

Using Singapore and Malaysia as proxies for different school policy in terms of mobile phone use, this study compares the extent of mobile phone use and problematic mobile phone use between adolescents who are allowed and not allowed to use mobile phone within school compound. This study found that Singaporean adolescents have higher frequency of mobile phone use as compared to Malaysian adolescents. Given that Malaysian adolescents are not allowed to use mobile phone in school, it expected that their frequency of mobile phone use would be much lower than Singapore adolescents who could use their mobile phone in school during the permissible period. Singapore's Ministry of Education (MOE) promotes the use of

ICT in education their educational system, especially in the context of classroom learning. Most of the schools in Singapore allow students to bring their mobile phone to school, but they could only use it for academic purposes in class or after dismissal time (Sin, 2017). In contrary, Malaysia's MOE strictly bans the use of mobile phone within the school compound. Students are not allowed to bring their mobile phone to school. If they do, they are required to surrender their mobile phone to school and retrieved it after school (Dom, 2009). As such, Singaporean adolescents may have higher frequency of mobile phone use than Malaysian adolescents.

Surprisingly, even though their frequency of mobile phone use is lower than Singaporean adolescents, Malaysian adolescents have higher tendencies of experiencing problematic mobile phone use as compared to Singaporean adolescents. This interesting finding could be explained by the mobile phone use policies, geographical differences, and transportation in both countries. As mentioned, Malaysia has tight policies in terms of mobile phone use in school. Given that Malaysian adolescents do not have access to their mobile phone when they are in school, they may have stronger urge to check their mobile phone when they are back at home. For example, they may want to check whether any of their friends send them a message or leave a comment on their Facebook post when there are away from their mobile phone. In addition, the public transportation in Malaysia is not very convenient that many Malaysian adolescents require their parents to send them to school or even friends gathering. As such, mobile phone becomes the most convenient communication medium for Malaysian adolescents to maintain relationships with their peers, especially with peers who stay far away from them and difficult to meet. Consequently, they are more likely to engage in antisocial type of problematic use (Billieux, 2015), such as mobile phone use in inappropriate context. For instance,

adolescents might use their mobile phone when they are attending tuition classes, doing their homework or even when they should be sleeping at night time.

These findings imply that prohibiting mobile phone use in school could reduce the frequency of mobile phone use, however, it may not reduce the problematic mobile phone use among adolescents. Therefore, it is important to further investigate other potential factors that could reduce adolescents' problematic mobile phone use, such as parental mediation. These findings could inform the educators and policymakers to devise appropriate information, communication, and technology (ICT) adoption plan in classroom learning and also to devise appropriate mobile phone policies in school. Moreover, future study should further examine the impact of mobile phone restriction and the use of ICT in school on adolescents' problematic mobile phone use.

To investigate the factors influencing mobile phone use and problematic mobile phone use among adolescents in Singapore and Malaysia, this study has conducted two hierarchical regression analyses. The results of the two analyses are discussed in the following sections. The first section discusses about the factors affecting mobile phone use among adolescents in Singapore and Malaysia. The second part explains the factors influencing problematic mobile phone use in both countries.

Factors Influencing Mobile Phone Use - Comparison between Singapore and Malaysia

Self: self-esteem, self-control, extraversion, and neuroticism

In terms of the self-perspective, only one of the social motives – self-esteem – is found to predict mobile phone use among adolescents. This study found that self-esteem is negatively associated with mobile phone use among adolescents in Singapore, indicating that those with low self-esteem tend to have high intensity of mobile phone use. This finding was in line with the previous studies (Ehrenberg,

Juckes, White, & Walsh, 2008). Ehrenberg and colleagues (2008) found that people with low self-esteem have higher frequency of instant messaging (IM) usage as compared to those with high self-esteem. However, self-esteem was not a significant predictor of mobile phone use among Malaysian adolescents. One possible explanation is due to the frequency of mobile phone usage among Malaysian adolescents. As explained in Chapter One, mobile phone use is prohibited in secondary school in Malaysia. Malaysian adolescents do not have access to their mobile phone during school hours. Given that most Malaysian students are occupied by tuition classes and intensive classes after school, it would be expected that the chance of using mobile phone is relatively low. Hence, adolescents' self-esteem may not have a significant impact on their mobile phone use. Indeed, previous study also yielded similar result showing non-significant relationship between self-esteem and mobile phone use (Butt & Philips, 2008). Butt and Philips (2008) explained that self-esteem may not associate with the frequency of mobile phone use, but it people with low self-esteem are more likely to be involved in problematic mobile phone use.

Moreover, this study found that extraverted adolescents have high frequency of mobile phone use. Extraversion was positively associated with mobile phone use in Singapore and Malaysia. These results are in agreement with past studies (e.g. Butt & Philips, 2008; Ehrenberg, et al., 2008). Extraverts are more sociable in nature (Bianchi & Philips, 2005). They are more likely to make friends online (Hsiao, 2017). The advanced mobile applications today, such as Skype, Whatsapp, WeChat, and social networking sites (SNSs), enable extraverts to keep in touch with their friends and thus, they are more likely to be addicted to these mobile phone applications (Andreassen et al., 2013). Previous studies also found extraversion to be positively associated with compulsive use of social applications (Hsiao, 2017).

However, neuroticism and self-control are not significantly associated with mobile phone use. These results are inconsistent with previous studies (Ezoe et al., 2009; Igarashi et al., 2008). The non-significant relationship between neuroticism and mobile phone use implies that neurotic adolescents in Singapore and Malaysia might not communicate with others about their feelings or maintain their relationships with others using mobile phone as suggested by previous study (Ezoe et al., 2009). Neurotic adolescents in Singapore and Malaysia might prefer other communication channels, such as face-to-face peer communication, given the long period of time spent with their peers in schools. As for self-control, the non-significant result implies that high intensity of mobile phone use is not due to lack of self-control. This finding also informs parents and educators that promoting self-control among adolescents may not be effective in reducing the intensity of mobile phone use among adolescents.

Parents: parental mobile phone use, parenting styles, and parental mediations

This study argued that parents are the role model of adolescents and their mobile phone use would have an impact on adolescents' mobile phone use. By using adolescents' self-reported survey, this study found that adolescents who perceived high intensity of parental mobile phone use tend to have higher frequency of mobile phone use than those who do not perceive high intensity of parental mobile phone use. These findings are in line with social learning theory (Bandura, 1977) which posits that children learn to behave by observing the surrounding people. Adolescents would imitate their parents' mobile phone behaviour if they perceive no negative consequences of such behaviours. Also, this finding was supported by previous literature (Epstein, 2012; Liu, et al., 2012; Vaala & Bleakly, 2015). Previous study (Epstein, 2012; Liu, et al., 2012; Vaala & Bleakly, 2015) revealed that parental media use may affect adolescents' media use as parents exert considerable influence on

adolescents. Therefore, parents should ensure that they be a good role model and ensure that ‘what you do’ is similar to ‘what you say’ (Liu et al., 2012), before practicing any parental mediation strategies on adolescents’ mobile phone use.

As for parenting styles and parental mediation strategies, none of the parenting styles and parental mediation strategies are associated with adolescents’ mobile phone use in Singapore and Malaysia, except for authoritarian parenting. Authoritarian parenting is found to be negatively associated with adolescents’ mobile phone use in Singapore. However, it is not associated with mobile phone use among adolescents in Malaysia. Authoritarian parents are strict and directive (Patock-Peckham et al., 2001; Yardi & Bruckman, 2011), they would use punishment to regulate their children’s behaviours. As such, authoritarian parents would also be strict in controlling adolescents’ mobile phone use. Therefore, adolescents who have authoritarian parents are more likely to have lower frequency of mobile phone use than other adolescents.

This study did not find support for the hypothesized relationship between other parenting styles (permissive and authoritative parenting) and adolescents’ mobile phone use. Likewise, this study did not find significant relationship between parental mediation strategies and adolescents’ mobile phone use. One possible explanation is disagreement between adolescents and parents on the parental mediation strategies practised at home (Liau, Khoo, & Ang, 2008). Adolescents might not be aware of the strategies used by parents to monitor their children’s mobile phone behaviours (Liau et al., 2008), such as checking their children’s last login on Facebook. Given that this study was conducted among adolescents, all the parental mediation strategies were measured based on adolescents’ perception. Thus, there might be discrete perceptions of parental mediation strategies between parents and adolescents. In addition, parents may not solely practise one type of parenting styles. Parents may use a mix of

parenting styles under different circumstances. For instance, parents might use strict punishment to control their children when they misbehave. However, they might also give clear direction for their children and reasonable explanation for the rule that they have set for their children. Likewise, parents might practise different types parental mediation strategies simultaneously to control adolescents' mobile phone use. More studies need to be conducted in order to investigate the effects of mixed parenting styles and mixed parental mediations on adolescents' mobile phone use and problematic mobile phone use.

Peers: peer norms, peer mediation, and peer capital

In line with group socialization theory, this study found that peers exerted the significant influence on both Singaporean and Malaysian adolescents' mobile phone use. These findings supported the arguments of group socialization theory (Harris, 1995) that peers exert prominent influence on adolescents' behaviour as compared to parents. In this study, peer discussion is found to be positively associated with mobile phone use among Singaporean and Malaysian adolescents. The peer mediation concept (Nathanson, 2001) postulates that peers create certain norms among adolescents. The discussion about mobile phone use among adolescents may form a misperception among adolescents that everyone is frequently using a particular mobile application or playing a particular mobile game, and it is fine for them to act in the similar way. Subsequently, the more adolescents discuss about mobile phone with their peers, the higher the frequency of their mobile phone use.

In Singapore and Malaysia, injunctive norms is found to predict adolescents' mobile phone use. In other words, the frequency of mobile phone use among adolescents will increase when they misperceive that their peers feel it is right to use mobile phone frequently. This relationship is supported by the social norms theory

which suggests that human behaviour is affected by the misperception of what other surrounding people do (Berkowit, 2004). Also, this finding is in line with group socialization theory which posits that peers exert significant influence on adolescents' behaviour. If adolescents think that many of their peers are frequent mobile phone users and it is "right" to use mobile phone frequently, they are more likely to have high frequency of mobile phone use, such as calling and texting, playing mobile games, and surfing social networking sites. Hence, these findings could inform parents and educators to take proper actions and clarify the misperception that it is "right" to use mobile phone frequently.

On the other hand, descriptive norms is only associated with mobile phone use among Singaporean adolescents, but not Malaysian adolescent. This finding suggests that the frequency of mobile phone use among Malaysian adolescent will not affected no matter how they perceive their peers' mobile phone behaviour. This finding is inconsistent with the results of previous studies (e.g. Baumgartner et al., 2011, Jiang, Ling, Feng, Wang, & Guo, 2017). Previous studies showed that both injunctive and descriptive norms are predictors of mobile phone behaviours, such as using mobile phone while crossing the road (Jiang et al, 2017) and risky sexual online behaviours (Baumgartner et al., 2011). One possible explanation is that Malaysian adolescents are not allowed to bring their mobile phone to school. Malaysian adolescents may not even know the frequency of mobile phone use among their peers no one is allowed to bring mobile phone to school. Therefore, descriptive norms may not have an impact on mobile phone use among Malaysian adolescents.

In terms of peer capital, this study shows interesting findings. Bonding peer capital did not predict Singaporean adolescents' mobile phone use, but it predicted Malaysian adolescents' mobile phone use. Conversely, bridging peer capital predicted

the mobile phone use among Singaporean adolescents, but not mobile phone use among Malaysian adolescents.

Despite the differences, these results imply that adolescents with larger peer capital, either bonding or bridging capital, tend to have higher intensity of mobile phone use. These findings are consistent with previous studies (Leung, 2008; Miyata & Kobayashi, 2008). The results show that Malaysian adolescents with larger bonding capital, or strong ties, tend to have higher intensity of mobile phone use. They are more likely to use mobile phone to maintain their relationships with their close peers. On the other hand, Singaporean adolescents with larger bridging capital, or weak ties, are more likely to have higher intensity of mobile phone use. This also indicates that they tend to use mobile phone to maintain their weak ties with their peers. This finding is consistent with Boase and Kobayashi's (2008) study which revealed that adolescents tend to use mobile phone to bridge social capital.

The differences in terms of the effects of bonding and bridging capital on mobile phone use between Singapore and Malaysia might possibly due to the context of the study. Singapore is a developed yet a small island-nation that has the most efficient public transport (Royston, 2014). It was ranked one of the safest countries in the world (Vijayan, 2014). It is easier for Singaporean adolescents to meet up with their close friends. In contrast, Malaysia is larger in terms of geographical area and the public transportation is not as convenient as compared to Singapore. It is relatively difficult for Malaysian adolescents to meet their peers after school due to distance and transportation constraints. Therefore, it is more likely that Malaysian would interact with their close friends after school via mobile phone. As such, Malaysian adolescents with larger bonding capital tend to have higher intensity of mobile phone use, while Singaporean adolescents with larger bridging capital are more likely to use mobile

phone to maintain their friendships. Future research could delve deeper into these findings to explore other potential factors differentiating the effects of bonding and bridging capital on mobile phone use.

Factors Influencing Problematic Mobile Phone Use - Comparison between Singapore and Malaysia

Self: self-esteem, self-control, extraversion, and neuroticism

This study found that only one of the social motives, self-control, is associated with problematic mobile phone use among adolescents. This study did not find significant relationship between self-esteem and problematic mobile phone use among Singaporean and Malaysian adolescents. This finding is inconsistent with previous study (Bianchi & Philips, 2005; Leung, 2008; Hong, et al., 2012). Scholars posit that adolescents with low self-esteem are less confident in nature (Leung, 2008) and thus, they would seek reassurance from others using mobile phone as it does not require face-to-face interactions. However, these group of adolescents may also seek reassurance from other socialization agents, such as teachers or family members. These group of adolescents are also more likely to receive high attention from teachers and parents that appropriate advice would be given, and actions would be taken if they engage in risky or problematic behaviours. Therefore, self-esteem may not be a significant indicator of problematic mobile phone use. Future study should further examine the relationship between self-esteem, attention received from teachers or parents, and problematic mobile phone use. Attention from teachers and parents might mediate the relationship between self-esteem and problematic mobile phone use.

Similarly, this study did not find support for the hypothesised relationship between extraversion and problematic mobile phone use among adolescents in Singapore and Malaysia. Indeed, one of the past studies also found no significant

relationship between extraversion and problematic mobile phone use (Ehrenberg, et al., 2008). The non-significant relationship may be due to other factors that mediate the relationship between extraversion and problematic mobile phone use. One example of such factors is parental control. Extraversion may have an indirect effect on problematic mobile phone use in which extraverted adolescents may receive strict parental control because of their extroverted personality. Due to strict parental control, extroverted adolescents are less likely to engage in problematic mobile phone use. More studies should be conducted in order to investigate whether the relationship between extraversion and problematic mobile phone use may be mediated by parental control.

On the other hand, neuroticism is found positively associated with problematic mobile phone use in both Singapore and Malaysia. Neurotic adolescents are emotional, easily anxious, worrying, and sensitive to relationships maintenance (Ezoe et al., 2009). This study shows that emotionally unstable adolescents are vulnerable to problematic mobile phone use. Past study found that neurotic people are less likely to misbehave when they interact with others using social media (Amichai-Hamburger, Wainapel, & Fox, 2002). Therefore, they may consistently update their status on mobile networking sites to express themselves (Hsiao, 2017), in order to relieve their stress and anxiety (Roberts et al., 2015). In line with this argument, neurotic adolescents are more vulnerable to problematic mobile phone use. In addition, self-control is also found to be negatively associated with problematic mobile phone use among adolescents in both countries. This implies that adolescents with high self-control are less likely to experience problematic mobile phone use. This finding is consistent with previous study (e.g. Billieux, 2012; Khang et al., 2013) which shows adolescents with high self-control are able to manage their own schedule and react according to it. Moreover, the pathway impulsive-antisocial pathway proposed by

Billieux et al. (2015) suggested that people who lack self-control are also aggressive. They often engage in antisocial pattern of problematic mobile phone use, such as using mobile phone in an inappropriate context.

Parents: parenting styles and parental mediations

Surprisingly, this study found that restrictive mediation and active mediation are positively associated with problematic mobile phone use among adolescents in Singapore. In addition, authoritarian parenting and mobile monitoring are positively associated with problematic mobile phone use among adolescents in Malaysia. These findings contradict existing studies (e.g. Lau & Yuen, 2013; Leung & Lee, 2012; Lee & Chae, 2012; Warren & Bluma, 2002). Previous studies found that parents play an important role in reducing problematic behaviours among adolescents by guiding their children, setting rules for mobile phone use, and advising their children on mobile phone use. The unexpected positive relationship between parental mediation and problematic mobile phone use among Singaporean adolescents could possibly be explained by the reverse psychology theory. The reverse psychology theory posits that adolescents are more independent and autonomous, and that they would run into conflict with parental overly restrictive control or guidance (Smith & Mackie, 2007; Nathanson, 2001). Moreover, older adolescents are more rebellious than children when rules or restrictions are implemented at home (Lwin et al., 2008). Hence, rebelliousness during adolescence could also be the reason for the positive relationship between parenting style, parental mediation, and problematic mobile phone use. Likewise, authoritarian parenting and mobile monitoring was positively associated with problematic mobile phone use among Malaysian adolescents. In other words, adolescents are more likely to be involved in problematic mobile phone use when

parents practise greater authoritarian parenting style, such as using strict punishment on their misbehaved children or strict monitoring on adolescents' mobile phone use.

However, the negative relationship between authoritative parenting and problematic mobile phone use suggests that authoritative parenting is effective in reducing problematic mobile phone use among Malaysian adolescents. The results were consistent with previous findings (e.g. Patock - Peckham et al., 2001; Patock-Peckham & Morgan-Lopez, 2006). Authoritative parents are parents who give clear guidelines for children coupled with reasonable explanations. Every rule and restriction set by authoritative parents are explained and adjustments are possible (Patock-Peckham & Morgan-Lopez, 2006). Hence, it is more acceptable by adolescents and thus, reduces adolescents' problematic mobile phone use. Overall, these findings could raise awareness among parents to choose appropriate parenting styles and parental mediation strategies in order to tackle problematic mobile phone use among adolescents as inappropriate strategies could lead to a reverse effect.

Peers: peer norms, peer mediations, and peer capital

With regard to peer influence, peers exert significant influence on adolescents' problematic mobile phone use, even though the self-perspective accounted the largest variance in predicting problematic mobile phone use among Singaporean and Malaysian adolescents. In particular, peer discussion predicted the problematic mobile phone use among adolescents in both Singapore and Malaysia. These findings support the concept of peer mediation proposed by Nathanson (2001). Peer discussion of mobile phone shape adolescents' attitudes toward mobile phone usage, resulting in higher tendency of problematic mobile phone use. These findings are in line with Shin and Lwin's (2017) argument that peer mediation and parental mediation have different direction of impacts on adolescents' mobile phone use. Peer mediation increases the

tendencies of problematic mobile phone use among adolescents as peers' comments or opinion could motivate adolescents' mobile phone use. Conversely, parental mediation of mobile phone use aims to reduce the negative consequences of mobile phone use among adolescents. Therefore, it is expected that the more adolescents discuss about mobile phone among their peers, the more likely they will engage in problematic mobile phone use.

Moreover, injunctive norm positively predicted problematic mobile phone use among Singaporean and Malaysian adolescents. These findings support the social norms theory (Perkin & Berkowitz, 1986; Baumgartner et al., 2011). Social norms theory postulates that human behaviours are influenced by their misperceptions of what the people around them perceive and do (Berkowitz, 2004). The findings of this study reveal that adolescents are more likely to experience problematic mobile phone use when they think that their peers approve their problematic behaviours. However, there is no significant relationship found between descriptive norms and problematic mobile phone use among Singaporean adolescents. One possible explanation is due to the pattern of problematic mobile phone use. According to Billieux and colleagues (2015), problematic mobile phone use involves three different type of patterns, namely addictive pattern, antisocial pattern, and risky pattern of use. These patterns of problematic use may result in different symptoms or behaviours. Some of these symptoms or behaviours are not easily observed by others, such as mobile phone aggressions, reassurance behaviours, and risky sexting having. Some of these symptoms and behaviours are more personal and adolescents may only be able to observe these symptoms or behaviours after a long period of time. Future study could further investigate the impacts of descriptive norms on different patterns of problematic use.

This study found that peer capital is associated with problematic mobile phone use only among Malaysian adolescents, but not Singaporean adolescents. As mentioned previously, mobile phone use is prohibited in secondary schools in Malaysia, while majority of the secondary schools in Singapore allow mobile phone use for academic purposes. Most of the schools in Singapore also allow students to use their mobile phone during non-curricular hours. As such, Singaporean adolescents may have more chances to use their mobile phone to keep in touch with their peers than Malaysian adolescents. Indeed, the results showed that the frequency of mobile phone use of Singaporean adolescents is significantly higher than Malaysian adolescents. Moreover, given that Singapore is a small island-country and the public transport in Singapore is so convenient that Singaporeans adolescents could reach out their peers easily. Mobile phone may be used for entertainment or other purposes rather than to build or maintain peer capital. Along with this argument, bonding and bridging peer capital do not significantly associate with problematic mobile phone use among Singaporean adolescents. Future study should further explore whether geographical distance could predict the problematic mobile phone use among adolescents. Contrary to Singapore, bridging peer capital is found to be positively associated with problematic mobile phone use among adolescents in Malaysia. The positive relationship between bridging peer capital and problematic mobile phone use infers that weak ties is an antecedent of problematic mobile phone use. One possible explanation is that Malaysia is a larger country as compared to Singapore and it is divided into peninsular Malaysia and East Malaysia by the South China Sea. Malaysian adolescents who stay far apart from each other may heavily rely on mobile phone to maintain their peer capital. Moreover, adolescents who strive to fit into a new peer group – bridging capital – may actively and excessively use mobile phone to

‘bridge’ their new capital. They may spend significant amount of time maintaining their new peer capital. Therefore, adolescents who have a stronger urge to make new friends using mobile phone are more vulnerable to problematic mobile phone use. They might ‘lose control’ of mobile phone use when they make new friends or when they are networking with peers that they seldom meet in schools.

Moderation Effects

Besides the main effects, this study also found several moderation effects. First, the results show that restrictive mediation moderated the relationship between extraversion and mobile phone use among Singaporean adolescents. Among extroverted Singaporean adolescents, those who receive high restrictive mediation is more likely to have high intensity of mobile phone use than those who received low restrictive mediation. Meanwhile, among adolescents with low extraversion, those who receive high restrictive mediation have lower frequency of mobile phone use as compared to those who receive low restrictive mediation. Similarly, an interaction effect is found between extraversion and active parental mediation on Singaporean adolescents’ mobile phone use. Among Singaporean adolescents with low extraversion, those with receive low active parental mediation is more likely to have higher frequency of mobile phone use as compared to those with those who receive high active parental mediation. However, for high extraversion adolescents, those who receive greater active mediation is more likely to have higher intensity of mobile phone use than those who received low active mediation.

These finding suggest that there is a reverse psychology effect when restrictive and active mediation is practised among extroverted Singaporean adolescents. Adolescents are confused and rebellious during puberty due to their biological changes (Macionis, 2014). Adolescence also is the period when the young people started to

perceive themselves as an adult (Macionis, 2014) and form their own social capital. Restrictive mediation would be perceived as a form of constraint to their socialization process which would lead to reverse psychological effect. Hence, restrictive mediation may not be an appropriate strategy to reduce the frequency of mobile phone use among highly extroverted adolescents. In fact, these findings imply that restrictive mediation (e.g. rule setting) and active parental mediation (e.g. discussion about the use and content of mobile phone) are more effective in reducing the frequency of mobile phone use among less extroverted adolescents. As every adolescent may have different personalities, different parental mediation strategies should be practised based on the personality of the adolescents in order to reduce their excessive mobile phone use.

Likewise, this study found an interaction effect between self-esteem and mobile monitoring on Malaysian adolescents' mobile phone use. The result shows that among Malaysian adolescent with low self-esteem, those who receive high mobile monitoring have lower frequency of mobile phone use than those who receive low mobile monitoring. Conversely, among Malaysian adolescents with high self-esteem, there no significant difference between those who receive high and low mobile monitoring. These findings suggest that adolescents, whose mobile activities are closely monitor by their parents, would have lower frequency of mobile phone use. In fact, adolescents with low self-esteem are less confident. They are less likely to communicate face-to-face with others. In order to seek reassurance from their peers, adolescents with low self-esteem are more likely to use mobile phone to communicate with others which does not required them to talk face-to-face. Therefore, mobile monitoring could be an effective way to reduce their mobile phone use. Parents could monitor their children's mobile phone use from time to time and immediate actions

can be taken if parents discover any inappropriate mobile phone use patterns by their children.

Comparison between Factors Influencing Mobile Phone Use and Factors Influencing Problematic Mobile Phone Use

This study is also the first study to compare the factors influencing mobile phone use and problematic mobile phone use by focusing on the three major perspectives – self, parents, and peers. This study argues that mobile phone use and problematic mobile phone use are two different behaviours. People with high frequency of mobile phone use may not necessarily involved in problematic mobile phone use (Merlo et al., 2013; Hong et al., 2012).

Self: self-esteem, self-control, extraversion, and neuroticism

The results of the analyses revealed that different self-factors predicted mobile phone use and problematic mobile phone. For example, this study found that adolescents with low self-esteem tend to have higher intensity of mobile phone use. However, self-esteem does not influence the level of problematic mobile phone use among adolescent. Likewise, extroverted adolescents are more likely to have higher intensity of mobile phone use, but they are not prone to problematic mobile phone use. Extraversion does not predict problematic mobile phone use among adolescents.

In contrast, self-control negatively predicted problematic mobile phone use, but not mobile phone use. These findings indicate that adolescents with low self-control are more likely to experience problematic mobile phone use. Similarly, the results also showed that neuroticism is positively associated with problematic mobile phone use, but not mobile phone use. Neurotic adolescents are more likely to experience problematic mobile phone use. These findings inform parents and educators that adolescents with low self-control and high neuroticism are more likely to be involved

in problematic mobile phone use. In addition, these findings also support the arguments of this study that mobile phone use and problematic mobile phone use are two different behaviours as they are predicted by different factors.

Parents: parental mobile phone use, parenting styles, and parental mediations

The results showed that mobile phone use and problematic mobile phone use are both predicted by authoritarian parenting style. However, authoritarian parenting style is negatively associated with mobile phone use, but positively associated with problematic mobile phone use. Moreover, restrictive mediation and mobile monitoring positively predicted problematic mobile phone use, but not mobile phone use. These findings again showed that mobile phone use and problematic mobile phone use are two different behaviours in which authoritarian parenting style is effective in reducing the intensity of mobile phone use among adolescents, but not problematic mobile phone use. In fact, authoritarian parenting style, restrictive mediation, and mobile monitoring have exerted reverse effects on adolescents' problematic mobile phone use.

Peers: peer norms, peer mediation, and peer capital

This study found that peer discussion, descriptive norm, injunctive norms, and bridging peer capital predicted both mobile phone use and problematic mobile phone use. However, bonding peer capital is only associated with mobile phone use, but not problematic mobile phone use.

In sum, mobile phone use and problematic mobile phone use are two different behaviours. High intensity of mobile phone use may not lead to problematic mobile phone use (Hong et al, 2012). There might be other factors contributing the high intensity of mobile phone use, such as work obligations (Merlo et al., 2013). In fact, Hong and colleagues found that the intensity of mobile phone use was a consequences

of problematic mobile phone use. Future studies are encouraged to further investigate the relationship between mobile phone use and problematic mobile phone use.

Implications and Limitations

This study has both theoretical and practical implications. In terms of theoretical implication, this study adds to the literature of mobile phone use and problematic mobile phone use, by being one of the first few studies to investigate mobile phone use and problematic mobile phone use from the perspectives of self, parents, and peers. Moreover, this study is also the pioneer in comparing mobile phone use and problematic mobile phone use among adolescents between Singapore and Malaysia. The study reveals that adolescents in Malaysia, who are prohibited to use mobile phone use, have lower frequency of mobile phone use than Singaporean adolescents. This implies that banning mobile phone use in school may reduce the adolescents' frequency of mobile phone use. Future studies could add to the literature of mobile phone use by further investigating the effect of different school's mobile phone use policies on the intensity of mobile phone use among adolescents.

Second, this study contributes to group socialization theory by showing that peers exert significant influence on adolescents' mobile phone use, especially in an out-of-home context. This study also found that individual factors, such as social motives and personality traits, exert substantial impacts on adolescents' problematic mobile phone use. Future research should also consider examining other socialization agents, such as teachers and family members, to examine problematic mobile phone use among adolescents. Third, this study contributes to the theory of parental mediation by adding a new variable – mobile monitoring – to the context of problematic mobile phone use. Mobile monitoring enables parental mediation theory

to gain new insights into adolescents' problematic mobile phone use, particularly on how parents use mobile phones to monitor their children.

Fourth, this dissertation contributes to the peer mediation literature by extending the peer mediation concept into the context of problematic mobile phone use. The concept of peer mediation derived from the theory of parental mediation and was first introduced by Nathanson (2001) in the context of television viewing. This study is among the first few studies that applies the concept of peer mediation in the context of mobile phone use. Fifth, the findings of this dissertation added to the literature of social norms theory by focusing on the effects of peer norms - injunctive and descriptive norms, on problematic mobile phone use. Sixth, by adapting the concept of social capital proposed by Putnam (1995), this study proposes a new construct - peer capital, which only focus on the social relationships between adolescents and their peers. Peer capital adds to the literature of social capital research by revealing the effects of peer capital on adolescents' mobile phone use and problematic mobile phone use.

In addition to the theoretical implications, this study also has several practical contributions. First, by assessing the effects of different care-giving styles or absent parenting on adolescents' mobile phone use and problematic mobile phone use, this study enables parents in Singapore and Malaysia to determine the most suitable parenting style and parental mediation strategies in order to encourage the safe and responsible use of mobile phones among adolescents. The findings of this dissertation suggested that adolescents reacted rebelliously toward parental mediation of mobile phone use. Perhaps, Malaysian parents should consider practicing authoritative parenting style which promotes a two-way communication between parents and children when it comes to rule-setting in the family. Second, this study enables

parents, educators, and guardians to apply suitable parenting styles and mobile phone mediation strategies on adolescents with different personalities to prevent them from falling into the category of problematic mobile phone users. This dissertation provides further information about the influence of adolescents' personalities on mobile phone use and problematic mobile phone use. These findings could allow parents to determine which parenting styles and parental mediation are applicable when handling adolescents with problematic mobile phone use. This information could also assist teachers to identify adolescents who are highly vulnerable to problematic mobile phone use. Subsequently, parents and teachers could adjust their care-giving styles based on the personalities of each adolescent.

Third, this study enables policymakers to devise appropriate policy and legislative responses pertaining to mobile phone use among adolescents in schools. This dissertation compared the level of mobile phone use and problematic mobile phone use between two countries that allows mobile phone use in the school (Singapore) and does not allow mobile phone use in school (Malaysia). The findings reveal that Malaysian adolescents would have higher problematic mobile phone use as compared to Singaporean adolescents, indicating that banning mobile phone use might not effectively reduce problematic mobile phone use. Indeed, schools that allow students to bring their mobile phone to school and use mobile phone for academic purposes must provide clear guidelines and expectations to students and parents, to prevent adolescents from procrastinating their school work or getting into trouble in school due to their mobile phone use.

Like many other studies, there are several limitations in this dissertation. First, both the data sets in this dissertation were collected using convenience sampling. As such, the result might not be generalizable to the adolescents in the whole of Singapore

and Malaysia. Future studies should replicate this study by using random sampling so that the findings are more representative. Moreover, the data collection in Malaysia was conducted in Penang – a state which majority of the residents are Chinese. The data collected in Malaysia is not generalizable to the whole population of Malaysia as the biggest ethnic group in Malaysia is Malay. Future studies could further explore the how the level of mobile phone use and problematic mobile phone use differs based on the ethnicity of a country.

Second, there is a narrow age-range of our participants. The sample of this study was adolescents from secondary schools and thus, the findings are not generalizable to the other mobile phone users from another age-group. Future study should consider extending this research by examining the influence of self, parental, and peers on the mobile phone behaviours among people from different age groups, such as youths or working adults.

Third, as this study was conducted among adolescents, parental-related variables were measured based on adolescents' perception. For example, parenting styles were measured based on adolescents' perception of the parenting styles practised by their parents. There might be disagreement between parents and adolescents in terms of the parenting styles or parental mediation strategies practised at home (Liau, Khoo, & Ang, 2008). Adolescents might not be aware of the strategies that parents use to monitor adolescents mobile phone behaviours (Liau et al, 2008), such as checking their last login on Facebook. Therefore, future study could contribute to the literature of parenting styles and parental mediation by comparing the agreement of parenting style and parenting mediation strategies among parents and adolescents. Furthermore, adolescents' mobile phone use and parental mobile phone use were measured by asking adolescents' perception of use, but not the actual amount of time

or frequency of use. Future study should measure both the adolescents' and parents' actual amount of time or frequency of mobile phone use to accurately measure the intensity of mobile phone use between adolescent and their parents.

Fourth, as this study is a cross-sectional study, the findings from this study cannot infer any causal relationship. Fourth, there are other socialization agents that are not included in this study, such as teachers and the mass media. Macionis (2014) suggested that there is a conflict between things portrayed by the mass media and restraint by parents. Adolescents may react differently based on the influence of different socialization agents in varying social context. Future study could also contribute to group socialization theory by exploring the influence of other socialization agents, such as teachers and mass media, on adolescents' mobile phone behaviours.

Lastly, there are few variables in this study that have low reliability. Although the measurement scale used in this study has been pre-tested for several rounds prior to the actual survey, there are few variables that have low reliability scores, such as mobile phone use (Malaysia), peer discussion (Singapore), and self-control (Malaysia)⁶. Future study could conduct a pilot test to validate the measurement to ensure that the same scale for a variable is applicable to two different countries.

In sum, this dissertation has demonstrated that the three major perspectives – self, parents, and peers exert significant influence on adolescents' problematic mobile

⁶ There are four variables in this study which have reliability scores below 0.70, including mobile phone use (Malaysia; Cronbach's $\alpha = .62$), self-esteem (Malaysia; Cronbach's $\alpha = .69$), self-control (Malaysia; Cronbach's $\alpha = .64$), and peer discussion (Singapore; Cronbach's $\alpha = .65$). Although the reliability scores are below 0.70, I suggested to include the variables in the analysis for following reasons. First, I understand that the common threshold for reliability score is 0.70. However, there are researchers who suggested that reliability score or alpha's value range between 0.60 and 0.70 is still acceptable (e.g. Schmitt, 1996; Sijtsma, 2009). Second, I have conducted composite reliability (CR) test. The results show that the CR-value for mobile phone use (Malaysia; CR = .79), self-esteem (Malaysia; CR = .80), self-control (Malaysia; CR = .77), and peer discussion (Singapore; CR = .81) are all acceptable. Therefore, I have included these variables in the analysis.

phone use. Adolescents learn from their surroundings and the socialization agents in the adolescents' daily life play an important role in influencing their mobile phone use and problematic behaviours. Finally, it is hoped that this dissertation could contribute to the whole body of communication literature and inspire more scholars to investigate mobile phone use and problematic mobile phone use from other perspectives.

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APPENDICES

Appendix A. Questionnaire

Study on Mobile Phone Use among Adolescents in Singapore

We are conducting this survey to better understand mobile phone use among adolescents in Singapore. Thank you for taking your time to complete this survey. There is no right or wrong answer to the questions. Just share your thoughts with us as only your personal responses matter.

Your participation is completely voluntary and you may choose to withdraw from this study at any point in time without any penalty. For example, even if you are halfway through filling out the questionnaire, you are free to withdraw from this study at any time. Your information will remain strictly confidential and the results of this study will not be linked to individuals in any way – we are only interested in finding out the general responses from adolescents. We will appreciate it if you can answer **ALL** the questions in this questionnaire.

Please raise your hand if you require additional information or clarification. If you have any concerns about the study, you can contact Dr. Shirley Ho or Ms. Agnes Chuah by phone at 6790-6044 or by email at schuah001@ntu.edu.sg.

Consent Form

1. I have been informed about the purpose of this study.
2. I understand that taking part in this study is voluntary, and I may withdraw from the study at any time.
3. I understand that my participation in this study is confidential. No information that could identify me will be used in any reports coming from this study.
4. I understand that if I have any questions or require information about this study, I can contact the researchers mentioned above.

I, _____ (full name) from Class _____ hereby agree to participate in this project. I have been informed of the purpose and content of this research project.

Signature of Student : _____

Date : _____

Wee Kim Wee School of Communication and Information

Instruction: Please CIRCLE your response unless indicated otherwise.

SECTION A

PART A:

For each of the statements below, indicate the degree to which you *agree or disagree* with the statements:

Scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

1. I feel that I am a person of worth, at least on an equal plane with others.	1	2	3	4	5
2. I feel that I have a number of good qualities.	1	2	3	4	5
3. All in all, I am inclined to feel that I am a failure.	1	2	3	4	5
4. I am able to do things as well as most other people.	1	2	3	4	5
5. I feel I do not have much to be proud of.	1	2	3	4	5
6. I have a positive attitude toward myself.	1	2	3	4	5
7. On the whole, I am satisfied with myself.	1	2	3	4	5
8. At times, I think I am no good at all.	1	2	3	4	5
9. I certainly feel useless at times.	1	2	3	4	5
10. I wish I could have more respect for myself.	1	2	3	4	5

PART B:

For each of the statements below, indicate the degree to which you *agree or disagree* with the statements:

Scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

1. I am a talkative person.	1	2	3	4	5
2. I am rather lively.	1	2	3	4	5
3. I enjoy meeting new people.	1	2	3	4	5
4. I usually let myself go and enjoy myself at a lively party.	1	2	3	4	5
5. I usually take the initiative in making new friends.	1	2	3	4	5
6. I can easily get some life into a boring party.	1	2	3	4	5
7. I tend to be reserved at social occasions.	1	2	3	4	5
8. I like mixing with people.	1	2	3	4	5
9. I like plenty of bustle and excitement around me.	1	2	3	4	5
10. I am mostly quiet when I am with other people.	1	2	3	4	5

11. Other people think that I am very lively.	1	2	3	4	5
12. I can make a party lively.	1	2	3	4	5

PART C:

For each of the statements below, indicate the degree to which you *agree or disagree* with the statements:

Scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

1. My mood often goes up and down.	1	2	3	4	5
2. I feel 'miserable' for no reason.	1	2	3	4	5
3. I am an irritable person.	1	2	3	4	5
4. My feelings are easily hurt.	1	2	3	4	5
5. I often feel 'fed-up'.	1	2	3	4	5
6. I will call myself a nervous person.	1	2	3	4	5
7. I often feel worried.	1	2	3	4	5
8. I will call myself tense or 'highly strung'.	1	2	3	4	5
9. I worry too long after an embarrassing experience.	1	2	3	4	5
10. I suffer from anxiety.	1	2	3	4	5
11. I often feel lonely.	1	2	3	4	5
12. I am often troubled by the feelings of guilt.	1	2	3	4	5

PART D:

For each of the statements below, indicate the degree to which you *agree or disagree* with the statements:

Scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

1. I am good at resisting temptation.	1	2	3	4	5
2. I have a hard time breaking bad habits.	1	2	3	4	5
3. I am lazy.	1	2	3	4	5
4. I say inappropriate things.	1	2	3	4	5
5. I do certain things that are bad for me, if they are fun.	1	2	3	4	5
6. I refuse things that are bad for me.	1	2	3	4	5
7. I wish I had more self-discipline.	1	2	3	4	5
8. People would say that I have strong self-discipline.	1	2	3	4	5
9. Pleasure and fun sometimes keep me from getting work done.	1	2	3	4	5
10. I have trouble concentrating.	1	2	3	4	5
11. I am able to work effectively toward long-term goals.	1	2	3	4	5
12. Sometimes I can't stop myself from doing something, even if I know it is wrong.	1	2	3	4	5
13. I often act without thinking through all the alternatives.	1	2	3	4	5

PART E:

For the question below, please **CIRCLE** your response.

1. Do you own a mobile phone?
 - a. Yes (if yes, proceed to question 2)
 - b. No (If no, proceed to Part F)
2. What type of mobile phone do you use?
 - a. Smartphone
 - b. Others: _____
3. Does your mobile phone have a data plan?
 - a. Yes
 - b. No

PART F:

For each of the statements below, indicate *how often you...*

Scale: 1 = Never 2 = Rarely 3 = Sometimes 4 = Very often 5 = Always

1. ...make/receive mobile phone calls in a week.	1	2	3	4	5
2. ...send/receive text messages in a week.	1	2	3	4	5
3. ...play mobile games in a week.	1	2	3	4	5
4. ...surf mobile social media in a week.	1	2	3	4	5

SECTION B

PART A:

For each of the statements below, indicate the degree to which you *agree or disagree* with the statements:

Scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree
--

1. My friends and I often discuss about...					
(a) ...mobile phone.	1	2	3	4	5
(b) ...mobile games.	1	2	3	4	5
(c) ...mobile social media.	1	2	3	4	5

PART B:

For each of the statements below, indicate the degree to which you ***agree or disagree*** with the statements:

Scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

1. My friends and I often...					
(a) ...use mobile phone to contact one another.	1	2	3	4	5
(b) ...play the same mobile games online.	1	2	3	4	5
(c) ...use the same mobile social media.	1	2	3	4	5

PART C:

For each of the statements below, please indicate ***the level of your peers' acceptability*** when you do the following:

Scale: 1 = Not acceptable at all 2 = Slightly not acceptable 3 = Neutral
4 = Slightly acceptable 5 = Very acceptable

What do your peers think of you when...

1. ...you use your mobile phone in class?	1	2	3	4	5
2. ...you spend too much time using your mobile phone?	1	2	3	4	5
3. ...you use your mobile phone while you should be doing your homework?	1	2	3	4	5
4. ...you ignore the people you are with in order to use your mobile phone?	1	2	3	4	5
5. ...you use your mobile phone when you should be sleeping?	1	2	3	4	5
6. ...you almost caused an accident due to your mobile phone use?	1	2	3	4	5
7. ...you got into trouble in school due to your mobile phone use?	1	2	3	4	5
8. ...your mobile phone use has caused you problems in relationships?	1	2	3	4	5

PART D:

Scale: 1 = No one 2 = Little of my peers 3 = Some of my peers
4 = Many of my peers 5 = Nearly all of my peers

On the scale of 1 to 5 (1=No one; 5=Nearly all of my friends), ***how many of your peers...***

1. ...use their mobile phone in class?	1	2	3	4	5
2. ...spend too much time using their mobile phone?	1	2	3	4	5
3. ...use their mobile phone while they should be doing their homework?	1	2	3	4	5
4. ...ignore the people they are with in order to use their mobile phone?	1	2	3	4	5

5. ...use their mobile phone when they should be sleeping?	1	2	3	4	5
6. ...almost caused an accident due to their mobile phone use?	1	2	3	4	5
7. ...got into trouble in school due to their mobile phone use?	1	2	3	4	5
8. ...mobile phone use has caused them problems in relationships?	1	2	3	4	5

PART E:

For each of the statements below, indicate the degree to which you *agree or disagree* with the statements:

Scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree
--

1. There are several peers I trust to help to solve my problems.	1	2	3	4	5
2. I can turn to my peers for advice about making very important decisions.	1	2	3	4	5
3. There is no one that I feel comfortable talking to about intimate personal problems.	1	2	3	4	5
4. When I feel lonely, there are several peers I can talk to.	1	2	3	4	5
5. If I needed an emergency loan of \$50, I know some peers I can turn to.	1	2	3	4	5
6. I do not know people well enough to get them to do anything important.	1	2	3	4	5
7. The peers I interact with would...					
(a) ...put their reputation on the line for me.	1	2	3	4	5
(b) ...be good resources for my homework.	1	2	3	4	5
(c) ...share their last dollar with me.	1	2	3	4	5
(d) ...help me fight an injustice.	1	2	3	4	5

PART F:

For each of the statements below, indicate the degree to which you *agree or disagree* with the statements:

Scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree
--

1. Interacting with my peers...					
(a) ...makes me interested in things that happen outside of my living area.	1	2	3	4	5
(b) ...makes me want to try new thing.	1	2	3	4	5
(c) ...makes me interested in what people unlike me are thinking.	1	2	3	4	5
(d) ...makes me curious about other places in the world.	1	2	3	4	5
(e) ...makes me feel like part of a larger community.	1	2	3	4	5
(f) ...makes me feel isolated.	1	2	3	4	5
(g) ...reminds me that everyone in the world is connected.	1	2	3	4	5
(h) ...allows me to talk to new people.	1	2	3	4	5
2. I am willing to spend time to support my peers' general activities.	1	2	3	4	5
3. Through mobile phone, I come in contact with new people all the time.	1	2	3	4	5

SECTION C

PART A:

For each of the statements below, indicate the degree to which you *agree or disagree* with the statements:

Scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

1. When I reduce the amount of time spent using my mobile phone I feel less satisfied.	1	2	3	4	5
2. I need more time using my mobile phone to feel satisfied than I used to need.	1	2	3	4	5
3. When I stop using my mobile phone, I get moody and irritable.	1	2	3	4	5
4. It would be very difficult, emotionally, to give up my mobile phone.	1	2	3	4	5
5. The amount of time I spend using my mobile phone keeps me from doing other important work.	1	2	3	4	5
6. I have thought in the past that it is not normal to spend as much time using a mobile phone as I do.	1	2	3	4	5
7. I think I might be spending too much time using my mobile phone.	1	2	3	4	5
8. People tell me I spend too much time using my mobile phone.	1	2	3	4	5
9. When I am not using my mobile phone, I am thinking about using it or planning the next time I can use it.	1	2	3	4	5
10. I feel anxious if I have not received a call or message in some time.	1	2	3	4	5
11. People think that I have a good control over my mobile phone use.	1	2	3	4	5

Part B:

For each of the statements below, indicate the degree to which you *agree or disagree* with the statements:

Scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

1. I have ignored the people I'm with in order to use my mobile phone.	1	2	3	4	5
2. I have used my mobile phone when I knew I should be doing schoolwork.	1	2	3	4	5
3. I have used my mobile phone when I knew I should be sleeping.	1	2	3	4	5
4. When I stop using my mobile phone because it is interfering with my life, I usually return to it.	1	2	3	4	5
5. I have gotten into trouble at work or school because of my mobile phone use.	1	2	3	4	5
6. At times, I find myself using my mobile phone instead of spending time with people who are important to me and want to spend time with me.	1	2	3	4	5

7. I have used my mobile phone when I knew it was dangerous to do so.	1	2	3	4	5
8. I have almost caused an accident because of my mobile phone use.	1	2	3	4	5
9. My mobile phone use has caused me problems in a relationship.	1	2	3	4	5
10. I have continued to use my mobile phone even when someone asked me to stop.	1	2	3	4	5
11. I have never get into problems because of my mobile phone use.	1	2	3	4	5

SECTION D

PART A:

For the question below, please **CIRCLE** your response.

- Which parent do you feel closer to?
 - Father
 - Mother
 - Male guardian
 - Female guardian
- Does your parent/guardian (whom you are closer to) own a mobile phone?
 - Yes (if yes, proceed to question 3)
 - No (If no, proceed to Part B)
- What type of mobile phone does your parent (whom you are closer to) use?
 - Smartphone
 - Others: _____

PART B:

For each of the statements below, indicate *how often your parent (whom you are closer to)...*

Scale: 1 = Never 2 = Rarely 3 = Sometimes 4 = Very often 5 = Always

1. ...make/receive mobile phone calls.	1	2	3	4	5
2. ...send/receive text messages.	1	2	3	4	5
3. ...play mobile games.	1	2	3	4	5
4. ...use mobile applications.	1	2	3	4	5
5. ...surf mobile social media.	1	2	3	4	5
6. ...surf mobile web.	1	2	3	4	5

PART C:

For each of the statements below, indicate *how often your parents...*

Scale: 1 = Never 2 = Rarely 3 = Sometimes 4 = Very often 5 = Always

1. ...tell you to stop using your mobile phone.	1	2	3	4	5
2. ...limit the amount of...					

(a) ...time that you can use your mobile phone.	1	2	3	4	5
(b) ...your mobile phone expenses.	1	2	3	4	5
3. ...limit the type of...					
(a) ...mobile games that you can play.	1	2	3	4	5
(b) ...mobile applications that you can use.	1	2	3	4	5
(c) ...mobile social media that you can use.	1	2	3	4	5
(d) ...mobile web that you can surf.	1	2	3	4	5

PART D:

For each of the statements below, indicate *how often your parents...*

Scale: 1 = Never 2 = Rarely 3 = Sometimes 4 = Very often 5 = Always

1. ...talk to you about advantages or disadvantages of mobile phone use.	1	2	3	4	5
2. ...talk to you about advantages or disadvantages of mobile game.	1	2	3	4	5
3. ...talk to you about advantages or disadvantages of mobile applications use.	1	2	3	4	5
4. ...talk to you about advantages or disadvantages of mobile Internet use.	1	2	3	4	5
5. ...talk to you about advantages or disadvantages of mobile social media use.	1	2	3	4	5

PART E:

For each of the statements below, indicate *how often your parents...*

Scale: 1 = Never 2 = Rarely 3 = Sometimes 4 = Very often 5 = Always

1. ...check your mobile phone.	1	2	3	4	5
2. ...monitor the last login of your mobile applications, such as Whatsapp, Facebook messenger and etc.	1	2	3	4	5
3. ...check the mobile games that you play.	1	2	3	4	5
4. ...check your mobile web history.	1	2	3	4	5
5. ...monitor or track your mobile social media, such as Facebook, Instagram, Twitter and etc.	1	2	3	4	5

PART F:

For each of the statements below, indicate the degree to which you *agree or disagree* with the statements:

Scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

1. My parents felt that it is good for me to conform to what they thought was right, even if I don't agree with them.	1	2	3	4	5
2. Whenever my parents told me to do something, they expected me to do it immediately without asking any questions.	1	2	3	4	5
3. I knew what my parents expected of me in the family	1	2	3	4	5

and they insisted that I conform to those expectations simply out of respect for their authority.

4. My parents...					
(a) ...did not allow me to question any decision they had made.	1	2	3	4	5
(b) ...felt that more force should be used by parents in order to get their children to behave the way they are supposed to.	1	2	3	4	5
(c) ...felt that wise parents should teach their children early just who is leader in the family.	1	2	3	4	5
(d) ...would get very upset if I tried to disagree with them.	1	2	3	4	5
(e) ...let me know what behaviour they expected of me, and if I didn't meet those expectations, they punished me.	1	2	3	4	5
(f) ...felt that most problems in society would be solved if parents could strictly and forcibly deal with their children when they don't do what they are supposed to.	1	2	3	4	5
(g) ...often told me exactly what they wanted me to do and how they expected me to do it.	1	2	3	4	5

PART G:

For each of the statements below, indicate the degree to which you ***agree or disagree*** with the statements:

Scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree
--

1. My parents...					
(a) ...felt that children should have their way in the family as often as the parents do.	1	2	3	4	5
(b) ...always felt that what children need is to be free to make up their own minds and to do what they want to do, even if their parents might not agree.	1	2	3	4	5
(c) ...did not feel that I needed to obey rules and regulations of behaviour simply because someone in authority had established them.	1	2	3	4	5
(d) ...seldom gave me expectations and guidelines for my behaviour.	1	2	3	4	5
(e) ...often did what the children in the family wanted when making family decisions.	1	2	3	4	5
(f) ...feel that most problems in society would be solved if parents do not restrict their children's activities, decisions, and desires.	1	2	3	4	5
(g) ...allowed me to decide most things for myself without a lot of directions from them.	1	2	3	4	5
(h) ...did not view themselves as responsible for directing and guiding my behaviour.	1	2	3	4	5
(i) ...allowed me to form my own point of view on family matters and to decide for myself what I was going to do.	1	2	3	4	5
(j) ...did not direct the behaviours, activities, and desires of the children in the family.	1	2	3	4	5

PART H:

For each of the statements below, indicate the degree to which you *agree or disagree* with the statements:

Scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree
--

1. Once family rules had been established, my parents discussed the reasons behind the policy with me.	1	2	3	4	5
2. I knew what my parents expected of me, but I am free to discuss those expectations with them.	1	2	3	4	5
3. If my parents made a decision in the family that hurt me, they were willing to discuss with me and to admit it if they had made a mistake.	1	2	3	4	5
4. My parents...					
(a) ...always encouraged verbal give-and-take whenever I felt that family rules and restrictions were unreasonable.	1	2	3	4	5
(b) ...directed the activities and decisions of the children in the family through reasoning and discipline.	1	2	3	4	5
(c) ...consistently gave me direction and guidance in rational and objective ways.	1	2	3	4	5
(d) ...took my opinions into consideration when making family decisions, but they would not decide for something simply because I wanted it.	1	2	3	4	5
(e) ...had clear standards of behaviour for the children in our home, but they are willing to adjust those standards to the needs of each individual children.	1	2	3	4	5
5. My parents gave me directions for my behaviour and activities...					
(a) ...and they expected me to follow their direction, but they are willing to listen to my concerns and to discuss that directions with me.	1	2	3	4	5
(b) ...but they also understood when I disagreed with them.	1	2	3	4	5

SECTION E

PART A:

For each of the statements below, indicate the degree to which you *agree or disagree* with the statements:

Scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree
--

1. I am negatively affected by mobile phone use.	1	2	3	4	5
2. My family members are negatively affected by mobile phone use.	1	2	3	4	5
3. My friends are negatively affected by mobile phone use.	1	2	3	4	5
4. Other people are negatively affected by mobile phone use.	1	2	3	4	5

SECTION F

Please **CIRCLE** your response.

1. Nationality: Singaporean/ Permanent Resident/ Others: _____
2. Gender: Male/Female
3. Race: Chinese/ Malay / Indian / Others: _____
4. Age: _____
5. School: _____
6. Current level of education:
 - a. Secondary 1
 - b. Secondary 2
 - c. Secondary 3
 - d. Secondary 4
 - e. Secondary 5
7. What type of residence are you staying in?
 - a. HDB 1-room or 2-room flat
 - b. HDB 3-room flat
 - c. HDB 4-room flat
 - d. HDB 5-room flat & Executive Flats
 - e. Condominiums & Other Apartments
 - f. Landed Properties
 - g. Others
 - h. Prefer not to disclose

We have come to the end of the study. Thank you for taking the time to participate in this survey and we will be glad to answer any additional questions that you have. Again, we want to assure you that all the data from this study will be coded and identified only by a subject number – the information will be kept strictly confidential and will not be linked to you. The data will only be used for the purposes of completing this project.

Thank you for your participation.

END OF SURVEY

Appendix B. Information Sheet and Parental Consent

Wee Kim Wee School of Communication and Information

Introduction:

Your child is being invited to join a research project headed by Dr. Shirley Ho from the Wee Kim Wee School of Communication and Information at Nanyang Technological University.

Purpose of Research:

This study aims to investigate mobile phone use among adolescents in Singapore.

What Your Child/Ward Will Do:

If you give permission for your child/ward to participate in this research study, he/she will be asked to complete an assent form and fill out a questionnaire that contains six sections. The questionnaire will take approximately 30 minutes to complete.

Confidentiality:

Any information that is obtained in connection with this study will remain confidential. When the results of the research are published or discussed in conferences and journals, no information will be included that would reveal your child/ward's identity. Data will be reported only in aggregate form and will not identify individual participants. The data will be stored securely in a locked facility, and only researchers conducting this study will have access to the information. Results of this study may be presented at conferences, and/or reported in books and/or academic journals in future.

Potential Risks:

There are no anticipated risks to this study.

Potential Benefits:

Your child's participation is important to this study, the Wee Kim Wee School of Communication and Information, and the scholarly community. His/her participation in this study will contribute to a better understanding of mobile phone use among Singaporean adolescents. Your child will receive a token of appreciation for his/her participation.

Voluntary Withdrawal:

Please remember that your child's participation in this study is completely voluntary, and that he/she is free to withdraw at any time during the study without penalty. For example, even if he/she is halfway through filling out the questionnaire, he/she is free to withdraw from the study at any time. However, we would greatly appreciate if he/she can answer ALL the questions. Your decision will have no effect on your child's current or future status or relationship with Nanyang Technological University.

Further Information:

If you have any questions about the study, please feel free to contact:

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Wee Kim Wee School of
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Nanyang Technological University
Email: tsyho@ntu.edu.sg
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Ms. Chuah Soo Fei
Doctoral Candidate
Wee Kim Wee School of
Communication and Information
Nanyang Technological University
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Tel: +65-6790-6565

Who to contact about your rights in this study:

Should you have any further questions or concerns regarding the survey, please contact:

Nanyang Technological University's Institutional Review Board
Email: irb@ntu.edu.sg
Tel: +65-6592-2495

PARENTAL CONSENT FORM

Dear Parent/Guardian:

Please read and complete the following form to indicate whether you give permission for your child/ward to participate in this study.

1. I have been informed about the purpose of this study.
2. I have had the opportunity to discuss this study with my child/ward.
3. I understand that my child/ward's participation in this study is voluntary, and that he/she may withdraw from the study at any time.
4. I understand that my child/ward's participation in this study is confidential. No information that could identify my child/ward will be used in any reports coming from this study.
5. I understand that if I have any questions or require information about this study, I can contact the researchers mentioned above.

I, _____ (*full name*), parent/guardian of
_____ (*child/ward's full name*), **DO / DO NOT**
(*please circle*) give permission for my child/ward to participate in this study.

Parent/Guardian's Signature: _____ Date: _____