

**NANYANG
TECHNOLOGICAL
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**WORK-RELATED SMARTPHONE DEPENDENCY
AMONG YOUNG WORKING ADULTS IN URBAN
CHINA: AN EXAMINATION OF THE DEPENDENCY
RELATIONS, ANTECEDENTS, AND CONSEQUENCES**

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DEDICATION

This dissertation is dedicated to my parents, Mr. Li Xuefeng and Mrs. Zhang Qunying, who have wholeheartedly supported me all the way since I was born. Without their love and encouragement, my studies could not be completed.

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ABSTRACT

Using smartphones for day-to-day working practices is now common for employees working in many organizations and companies. This dissertation is among the first to apply Media System Dependency (MSD) theory to understand smartphone dependency within a working context. By targeting young working adults in mainland China, this dissertation aims to answer three questions: 1) what kinds of dependency relations that young Chinese workers develop with their smartphones at work; 2) what are the antecedents of these work-related smartphone dependency relations; and 3) what are the consequences of these work-related smartphone dependency relations.

Two empirical studies were carried out to answer these research questions. Given limited research on smartphone dependency at work settings, an exploratory interview study (Study 1) was conducted during February to March 2015. The purpose of Study 1 is to closely understand Chinese workers' smartphone dependency at work and develop a solid research framework in explicating its antecedents and consequences. Interviews with 32 young Chinese workers show that they were mainly dependent on smartphones to fulfil three types of goals at work, namely, understanding (e.g., being updated of work-related information), orientation (e.g., performing effective work-related actions), and communication (e.g., communicating work-related matters). As for the antecedents, three task attributes (i.e., task interdependence, task mobility, and time criticality), organizational norm, managerial support, and two psychological factors (i.e., smartphone self-efficacy and conscientiousness) were identified to affect their smartphone dependency at work. Moreover, respondents indicated that depending on smartphones at work could

strengthen their job performance and workplace social capital. At the same time, it also triggered undesirable smartphone addiction symptoms.

Based on the results of Study 1, a research model regarding the interrelationships of the antecedents and consequences of work-related smartphone dependency were developed. The purpose of Study 2 is test these interrelationships by using a survey data from 527 young employees in China. Findings from Study 2 show that young Chinese workers developed fairly strong dependency with their smartphones at work. Notably, communication dependency relation was the most intensive one, followed by understanding and orientation dependency relations. Organizational norm and managerial support were two strongest predictors of work-related smartphone dependency relations. Regarding the influence of task attributes, task interdependence was associated with understanding dependency and communication dependency, while time criticality was associated with understanding dependency. No significant connection was found between task mobility and all three dependency relations. In terms of individual factors, conscientiousness was positively associated with understanding dependency and orientation dependency, while smartphone self-efficacy was linked to communication dependency and orientation dependency. As for consequences, the findings indicate that different smartphone dependency relations were associated with different outcomes at work. In particular, orientation dependency was associated with employees' job performance, while communication dependency was correlated with their workplace social capital. Interestingly, no association was found between communication dependency and smartphone addiction symptoms.

Taken together, this dissertation is among the first to investigate smartphone dependency at work settings. Its application of the MSD theory provides a new

theoretical approach to understand individual-smartphone dependency, as well as its antecedents and consequences. In the process, this dissertation also examines how the MSD theory, largely developed in traditional media environments, can be useful in understanding and explaining smartphone dependency in a specific working context, thereby extending and advancing the theoretical application. Practically, this dissertation helps the employers and companies to understand how and why their employees are dependent on smartphones at work, and what are the positive and negative consequences of such dependency, so as to develop effective management strategies.

CHAPTER ONE INTRODUCTION

1.1 Background and Motivation

“Technology is changing our world more than ever before.

The catalyst now is the Smartphone.” – Larry Rosen

The mobile phone has been considered the third greatest innovation in the past 30 years because it has dramatically changed the ways of human communication and information sharing (Drouin, Kaiser, & Miller, 2015; Korkki, 2009). Smartphones are the most recent generation of mobile phones that are administrated by advanced operating systems, such as iOS, Symbian OS, Windows Mobile, and Android (Litchfield, 2010; Sanne, 2009). According to Ericsson’s (2016) *Mobility Report*, the global smartphone subscriptions surpassed 3.9 billion in 2016, and this number was expected to reach close to 6.8 billion by the end of 2022. Considering the world’s population is roughly 7.4 billion (Worldometers, 2016), over 90% of the world’s population would have a smartphone in 2022 if each subscription belonged to a single subscriber. These statistics are somewhat unsurprising especially when smartphones become increasingly affordable and sophisticated. In addition to provide basic voice calling and short messaging services, the advanced functionalities of smartphones enable people to run a wide variety of native software applications and connect to innumerable Internet-based services including email, geolocation, streaming video and social networking without being restricted by physical proximity or spatial immobility (Kenney & Pon, 2011). Thus, the modern smartphones become a sort of one-stop shop for mobile communication that attracts an increasing number of people use its services to fulfill various personal or work-related goals (Drouin et al., 2015).

Using smartphones for day-to-day working practices is now common for employees working in many organizations and companies (Derks, Duin, Tims, & Bakker, 2015; Kossek & Lautsch, 2012; Kreiner, Hollensbe, & Sheep, 2009; Major & Germano, 2006). One survey by Good Technology shows that more than 132 million people used their smartphones at work as of 2014, and this number was expected to increase to 328 million by 2017 (Fried, 2014). Past studies found various benefits of using smartphones at work, such as instant access to emails and websites, rapid responses to time-critical events, round-the clock connection with colleagues and clients, and on-the-go work schedule management and document editing (e.g., Collins, Cox, & Wootton, 2015; Kossek & Lautsch, 2012; Lanaj, Johnson, & Barnes, 2014; Perlow, 2012). Because of these unprecedented work-related advantages, employees have had intensifying dependency on their smartphones at work. A Forrester's market survey on 5,500 smartphone-equipped workers in North America and Europe reveals that at least half of the respondents turned to be increasingly dependent on their smartphones to access work e-mail and perform other desktop tasks, such as internet browsing, note taking, and document editing (Murphy, 2011). Another report from the Center for Creative Leadership shows that nearly 60% of American workers relied on smartphones to stay connected with their work 24/7 and immediately respond to work matters (Deal, 2013). These statistics suggest that smartphone dependency prevails among working people, and thus, it is worthwhile to have scholarly investigations about smartphone dependency in the work domain.

In recent years, many scholars have paid attention to the line of research on smartphone dependency (Ahn, Jun, & Kim, 2015; Chen, Chen, & Lee, 2015; Choi & Yoo, 2015; Harun, Soon, Kassim, & Sulong, 2015; Lee et al., 2016; Lin, Chiang, & Jiang, 2015; Lin, Li, Chiang, & Liang, 2014; Park, Kim, Shon, & Shim, 2013; Salehan

& Negahban, 2013; Suki & Suki, 2013; Ting, Lim, Patanmacia, Low, & Ker, 2011). However, they have three major research gaps. First, little research has investigated smartphone dependency from a theoretical perspective. Given the lack of theoretical guidance, smartphone dependency was often studied as a similar concept to smartphone addiction or problematic/excessive smartphone use without a clear and consistent conceptualization (e.g., Lee et al., 2016; Park et al., 2013; Salehan & Negahban, 2013). This lack of clarity in definition and diversity in measurement significantly blocks empirical validation and scholarly understanding of smartphone dependency. Second, existing research has mainly focused on adolescents or university student samples (e.g., Lin et al., 2015; Park et al., 2013). Therefore, despite the prevalence of smartphone dependency among organizational workers, our understanding about how working people dependent on their smartphones is limited. Given the motivations and patterns of smartphone use are likely to be different among students and working adults, it is imperative to empirically investigate the smartphone dependency of working people. Third, the influence of social-structural environment on individuals' smartphone dependency has been largely overlooked among past research as they focused primarily on exploring its demographic and psychological predictors (e.g., Lin et al., 2015; Park et al., 2013). Given extent scholarships suggest that people's media usage patterns and dependency were affected by their social environment (e.g., Hahn & Kim, 2013; Hu & Zhang, 2014; Moody & Siponen, 2013; Morahan-Martin & Schumacher, 2000; Ting et al., 2011), it is worthwhile to investigate those social-structural antecedents of smartphone dependency in order to gain a broader understanding of it.

To fill these research gaps, this dissertation uses the Media System Dependency (MSD) theory (Ball-Rokeach, 1985, 1998; Ball-Rokeach & DeFleur,

1976), a widely-used communication framework to understand the individual-media connections (e.g., Patwardhan & Yang, 2003; Sun, Rubin, & Haridakis, 2008; Tai & Sun, 2007), as the theoretical underpinning to investigate working adults' smartphone dependency at work settings. In particular, through the theoretical lens of the MSD theory, smartphone dependency in this dissertation is not defined closely to smartphone addiction or problematic smartphone use, but rather viewed as the relational state that reflects individuals' reliance on their smartphones to meet various work-related goals.

1.2 Research Context

China is selected as the study site because it has the largest smartphone consumer base in the world and Chinese working people become increasingly dependent on their smartphones at work. According to the latest report from iiMedia (2016), a global leading mobile Internet research organization, the number of smartphone users in China reached 624 million as of March 2016. This number, accounting for nearly 50% of China's population, is the highest in the global smartphone market. Moreover, with the maturity of the 3G and 4G networks, and the dramatic rise in mobile apps, Chinese netizens have placed greater focus on their smartphones instead of PCs in recent years (Deloitte, 2013). The recent report from the China Internet Network Information Center (CNNIC) shows that more than 90% of China's netizens accessed the Internet via smartphones by the end of 2015 (Chinadaily, 2016). Instant messaging, news reading, mobile search, online music and videos, as well as online payments, are the most popular mobile applications that cater for Chinese people's daily needs (Liu, 2016).

In addition, the proliferation of smartphones and wireless broadband telecommunication infrastructure in China have affected how Chinese people perform their tasks and get their work done (Liu, Tian, Wang, & Huang, 2011). At present, relying on smartphones to facilitate anytime-anywhere connectedness of employees with their work becomes a new trend in urban China (Li & Lin, 2016). A large-scaled market survey by Alliance (2013) reveals that approximately 80% of 10,233 randomly selected Chinese workers had high dependence on their smartphones to stay connected with their work and deal with work-related matters. The increasing popularity of depending on smartphones to facilitate everyday working practices has been also evidenced in several anecdotal news reports in China (e.g., News.longhoo.net, 2013; Qingdaonews.com, 2015; Sina, 2013). These statistics indicate that China provides a suitable context for examining employees' smartphone dependency at work.

In particular, this dissertation focuses on working adults aged 18-35 years old in urban China. iiMedia Research (2016) reports that adults aged between 26 and 35 years old are the largest segment of smartphone users in China (27.6%), followed by youths between 18 and 25 years old (25.2%). These two groups of people, which comprise more than half of all smartphone users, are the new-generation smartphone-equipped workforce in China. Thus, it is critical to examine how these young working adults in China are dependent on their smartphones at work setting. Besides, it is well known that there are major differences between urban cities and rural areas in China. Majority of Chinese people in remote districts may not even have the smartphones, not to mention using smartphones at work. On the other hand, nowadays, an increasing number of the young adults in rural China have migrated to urban cities for job opportunities and better living conditions (Fang, Sun, & Yuen, 2016). Therefore, this dissertation focuses on young working adults in urban China.

1.3 Research Objectives and Significance

This dissertation aims to investigate the work-related smartphone dependency of young working adults in urban China. Particularly, guided by the MSD theory, I am interested in understanding three aspects of work-related smartphone dependency: nature of dependency relations, antecedents, and consequences of such dependency relations. Therefore, there are three specific research objectives in this dissertation.

The first key objective is to examine the nature of dependency relations between young Chinese workers and their smartphones at work. The MSD theory (Ball-Rokeach, 1985) indicates that individuals develop various dependency relations with media based on their specific goals. In this vein, this dissertation attempts to explore the types of dependency relations that young Chinese workers develop with their smartphones at work. The second objective is to investigate the antecedents of these dependency relations. The MSD theory posits that individual-media dependency is influenced by their social-structural environments. Thus, this dissertation seeks to find out what are the social-structural factors affecting young Chinese worker's smartphone dependency relations at work. In addition, based on existing literature, I am also interested in examining if any psychological factors influence their work-related smartphone dependency relations. Lastly, given that the MSD theory (Ball-Rokeach, 1985) posits that the nature and intensity of individual-media dependency relations can result in various cognitive, affective, and behavioral outcomes, this dissertation aims to explore the positive and negative outcomes of these work-related smartphone dependency relations.

I conducted two consecutive studies (hereafter "Study 1" and "Study 2") to investigate these research objectives. Initially, to closely understand work-related

smartphone dependency relations of Chinese workers and develop a valid research model in explicating the antecedents and consequences of such dependency relations, I interviewed 32 young employees in China (Study 1). Based on the existing literature and results of Study 1, a research model of work-related smartphone dependency was developed. Study 2 is a survey of 527 young Chinese workers for quantitatively testing the interrelationships proposed in this research model. In short, this dissertation is a mixed-method research that combines the elements of qualitative and quantitative approaches to obtain the breadth and depth of understanding of the work-related smartphone dependency of young Chinese working adults.

This dissertation can make a significant contribution to the body of knowledge in several ways. First, this dissertation is the first original study in the field to examine smartphone dependency of working people, to the best of my knowledge. As such, the findings of current dissertation can contribute significant literature to the understand smartphone dependency among young working adults, who have been seldom paid scholarly attention to. Second, this dissertation is among the first to apply the MSD framework to investigate smartphone dependency in work settings. Its application of the MSD theory can provide a different theoretical approach to understand smartphone dependency to overcome the limitations in past studies (e.g., Ahn et al., 2015; Chen et al., 2015; Park et al, 2013; Salehan & Negahban, 2013). Third, in the process, this dissertation also examines how the MSD theory, which is developed in traditional media environments (Ball-Rokeach, 1985), can be useful in understanding and explaining media dependency in the organizational and smartphone media context. Thus, the theoretical application of MSD theory can be extended and advanced. Fourth, this research is the pioneer one to differentiate the concept of smartphone dependency from smartphone addiction, and to explore the relationship between these

two concepts. Examining the linkage between these two concepts can significantly contribute to the understanding of them and shed light on future related studies. Fifth, by targeting young workers in China, this dissertation can contribute a Chinese perspective on smartphone dependency at work. Finally, by adopting a mixed-method approach, this dissertation can provide more rigorous knowledge to the topic of smartphone dependency than most previous studies that have primarily used quantitative survey designs. In practice, this dissertation can help employers and companies to understand how and why their employees are dependent on smartphones at work, and what are the outcomes of such dependency. Therefore, effective management strategies can be developed at the workplace.

1.4 Organization of the Chapters

This dissertation consists of seven chapters. Chapter 1 describes the research background, context, and objectives. Chapter 2 is the literature review part for this dissertation. Specifically, it discusses smartphone use at work; presents previous literature on media dependency and smartphone dependency; elaborates how the assumptions and central propositions of the MSD theory inform my research; and proposes possible antecedents and outcomes of work-related smartphone dependency relations. Chapter 3 presents the research objectives and process of Study 1 (qualitative interview study). In particular, the sampling technique, and the data collection and analysis procedures to which Study 1 has adhered are documented in this chapter. Chapter 4 displays the findings of Study 1 and elaborates how these findings inform the development of the research model. Notably, the research model on the antecedents and outcomes of work-related smartphone dependency is proposed at the end of Chapter 4. Chapter 5 describes the research objectives and process of

Study 2 (quantitative survey study). The sampling approaches, data collection process, measures for key variables, and data analysis procedures of Study 2 are illustrated in this chapter. Chapter 6 presents the findings of Study 2. Finally, Chapter 7 provides an overall discussion and conclusion about the major findings of Study 1 and Study 2. The major theoretical and practical contributions, limitations, and future research directions are also highlighted in this chapter.

CHAPTER TWO LITERATURE REVIEW

The purpose of Chapter 2 is to establish the theoretical and empirical foundation for this dissertation. It includes six sections. The first section will discuss smartphone use at work, which will provide the basis for this dissertation. Second and third sections will present a review of previous literature on the topic of media dependency and smartphone dependency, which will shed light on the conceptualization of work-related smartphone dependency in this dissertation. In fourth section, a review of the theoretical framework of MSD theory will be provided. Based on the discussions on the assumptions and central propositions of MSD theory, the last three sections will elaborate on how the MSD theory informs this research on work-related smartphone dependency. Specifically, the possible work-related smartphone dependency relations, antecedent factors and outcomes will be discussed in these sections by reviewing related literature.

2.1 Smartphone Use at Work

In the past, employees typically relied on desktops or laptops to support a wide range of professional tasks (Dearman & Pierce, 2008). However, a recent report from Frost and Sullivan (2016) shows that, while desktop and laptops are still the devices used prevalently in the workplace, smartphone use is now catching up in various industrial sectors such as financial, healthcare, government, and transportation. The rise of smartphone use in modern organizations has been linked to its compelling benefits at work, such as productivity improvement, speed of information exchange, flexible work management, and the quality of collaboration with colleagues and

partners (Derks, Duin, Tims, & Bakker, 2015; Kossek & Lautsch, 2012; Kreiner, Hollensbe, & Sheep, 2009; Major & Germano, 2006).

Smartphones are the recent generation of mobile phones which provide advanced computing ability and connectivity (Litchfield, 2010). In addition to the basic capabilities of voice calls and SMS, smartphones possess the similar function of desk PCs, such as access to various Internet services (Lepp, Barkley, & Karpinski, 2014; Li, 2014). Therefore, they are increasingly able to support a wide variety of traditionally desktop-based tasks such as web browsing, emailing, video conferencing, reviewing and even editing documents (Derks, Duin, Tims, & Bakker, 2014; Karlson et al., 2009). More importantly, compared with traditional work PCs, smartphones differ considerably in terms of the level of portability, acceptability for extending use into non-work hours, and connectivity (Karlson et al., 2009). First, smartphones are very easy to carry around because they are smaller and lighter, while traditional work PCs generally can be used in a fixed work station (Sung, 2012). Such high level of portability leads to an increased mobility of workers from their fixed workplaces. Second, unlike desk PCs which are mostly used in the working hours, smartphones allow workers to access to their work files and perform work-related actions whenever they want (Boswell & Olson-Buchanan, 2007). This high level of acceptability for extending use into non-work hours enables employees to have a more flexible work management during “down time” (Mazmanian, Yates, & Orlikowski, 2006). Pitichat (2013) pointed out that these two special attributes of smartphones tremendously promote the autonomy in the workplace by allowing employees to perform their work irrespective of time and space, and, consequently, make employees feel better and complete their job tasks more efficiently. The last difference between smartphones and desk PCs lies in the level of connectivity. Compared with desk PCs or other new

media technologies, a typical strength of smartphones is their facilitation of interpersonal connections (Gerpott et al., 2013; Sung, 2012). With the integration between smartphones and social network applications, smartphone use could greatly improve the connectedness at the workplace by allowing workers to stay informed and connected with each other (Diaz, Chiaburu, Zimmerman, & Boswell, 2012; Li, 2014; Pitichat, 2013). Thus, due to abovementioned differences or advantages, smartphones become a recent addition to the work ecosystem of many organizations and companies. An increasing number of companies start to encourage or require their employees to use smartphones for work reasons. One study from Lee et al. (2012) shows that using smartphones in the workplace and for work-related purposes has become a part of some companies' policies, and an increasing number of employees were asked to respond to their work 24 hours and 7 days a week through smartphones.

Report from Good Technology shows that more than 132 million people used their smartphones at work as of 2014, and that this number is expected to skyrocket to 328 million by 2017 (Fried, 2014). Another large-scaled market survey from Frost and Sullivan (2016) reports that nearly 75% of working people has used their smartphones to get work done in nowadays. Besides, the increase in smartphone use in organizations has been proven in many studies in various contexts, including the USA (Mazmanian et al., 2006; McBride et al., 2015; Middleton, 2007; 2008), Australia (Herrington, 2009; Koehler et al., 2013), the United Kingdom (Moore and Jayewardene, 2014), and Asia (Lee, Yap, Chong, & Th'ng, 2013; Ling et al., 2015; Osman et al., 2011), as well as in a variety of news articles (Frost and Sullivan, 2016; Onset Technology Inc., 2008; NST, 2011; Borneo Post Online, 2011; ITproportal.com, 2011; Nursing Times, 2015; TMCnet.com, 2012). Statistics on smartphone use among working people in various organizations suggest that employees have engendered

intensified dependency with their smartphones at work. Therefore, it is worthwhile to have scholarly investigation on it.

2.2 Media Dependency

Media dependency research arose out of the pronounced effects of media in modern society. Various interpretations of “media dependency” can be found in mass communication literature. For instance, Becker and Whitney (1980) interpreted media dependency as media reliance and use. Taking this approach, individuals dependent on a specific medium would have higher exposure to that medium and lower exposure to the alternative medium. Taylor (1991) defined media dependency as a complex construct by combining measures of media exposure, affinity, and preference. He believed that people preferred to use the medium to which they were more exposed to despite the availability of functional alternatives. However, in Salwen’s (1987) study of mass media dependency, media dependency was considered to be an audience classification principle: respondents who reported receiving most of their information on the environment from the mass media were classified as media-dependent and vice versa.

Except for the aforementioned interpretations of media dependency, two dominant approaches to conceptualize media dependency have been found in the field of communication research. One influential approach is put forth by DeFleur and Ball-Rokeach (1975), who used the term “media dependency” to conceptually define goal-resource tripartite relationships between audiences, media, and society. According to this approach, dependency refers to a relationship wherein satisfying the needs or attaining the goals of one party relies on another party’s resources (Ball-Rokeach & DeFleur, 1976; DeFleur & Ball-Rokeach, 1975, 1989). In this sense, media

dependency, on an individual level, is the dependency relationship reflecting people's reliance on the mass media to achieve goals, which is generally operationalized as the perceived helpfulness of a medium to an individual in meeting his/her goals (DeFleur & Ball-Rokeach, 1975). As people become more dependent on the use of media to attain their goals, the media tend to have greater influence on them. This early conceptualization of media dependency gradually evolved into the formulation of a more comprehensive theoretical framework, the MSD theory (Ball-Rokeach, 1998, 1985; DeFleur & Ball-Rokeach, 1989). Extensive prior research on different media genres, such as newspapers, radio, magazines, television, and Internet, has followed this line of conceptualization and operationalization of media dependency (e.g., Ball-Rokeach, 1998; Grant, Guthrie, & Ball-Rokeach, 1991; Loges, 1994; Lowrey, 2004; Ognyanova & Ball-Rokeach, 2015; Skumanich & Kintsfather, 1998; Sun et al., 2008).

Another popular approach views media dependency as a type of media effect and uses it as a synonym of media addiction. According to this approach, dependency is a negative and pathological concept which refers to the demonstration of significant impairment or distress because of a maladaptive pattern of media use (McIlwraith, 1998). Users who are dependent on the media feel an urge to consume media regardless of the potentially adverse consequences that makes persistent consumption of media seem irrational or out of control (LaRose, Lin, & Eastin, 2003). Thus, media dependency under this approach is often evaluated through a system of subjective, behavioral, physiological symptoms such as preoccupation, loss of control, and withdrawal (e.g., Armstrong, Phillips, & Saling, 2000; Bian & Leung, 2015; Kim & Haridakis, 2009; LaRose et al., 2003; Lin & Tsai, 2002; Park & Lee, 2011; Walsh et al., 2008). Many studies have also employed this approach to examine media dependency in different media use contexts such as television (Smith, 1986;

Mellwraith, 1998; Kubey, 1996), video games (Keepers, 1990; Griffiths, 1991), massive multiplayer online games (Liu & Peng, 2009), Internet (Kim & Haridakis, 2009), and mobile phones (Lee et al., 2016; Leung, 2008).

These interpretations of “media dependency” in mass media literature suggest that although media dependency per se was a legitimate and popular construct by researchers, it lacks a consistent and clear conceptualization. Such limitation directly influenced the domain of research on different genres of media dependency.

2.3 Smartphone Dependency

Smartphone dependency is one genre of media dependency that has attracted large amounts of academic attention in recent years (e.g., Ahn et al., 2015; Chen et al., 2015; Choi & Yoo, 2015; Harun et al., 2015; Lapierre & Lewis, 2016; Lin et al., 2014; Lin et al., 2015; Park et al., 2013; Suki & Suki, 2013; Ting et al., 2011). However, because of the confusion regarding the concept of media dependency in communication research, the term of “smartphone dependency” lacks a consistent and clear conceptualization. For instance, Lapierre and Lewis (2016) used smartphone dependency as a similar concept of smartphone addiction, which was measured by smartphone addiction scale of Kim, Lee, Lee, Nam, and Chung (2014). Chen, Chen and Lee (2015) also considered smartphone dependency similar to smartphone addiction but measured it by referring to the Mobile Phone Involvement Questionnaire developed by Walsh et al. (2010). Ting et al. (2011) did not provide a definition about smartphone dependency in their study but used it as a multifaceted construct measured by smartphone usage and reliance. Although Park, Kim, Shon, and Shim (2013) defined smartphone dependency as a relationship wherein the capability of people to achieve their goals depends on their smartphones, they measured it with the self-

created statements relating to excessive smartphone use. Such lack of clarity in definition and diversity in measurement represents a major stumbling block in the empirical validation and theoretical development of smartphone dependency. Thus, clarifying the concept of smartphone dependency and distinguishing it from other concepts, such as smartphone addiction, is particularly necessary.

In this dissertation, smartphone dependency and smartphone addiction are considered as two different theoretical concepts. Following the theoretical prism of the MSD theory (Ball-Rokeach, 1985, 1988; Ball-Rokeach & DeFleur, 1976), smartphone dependency in this dissertation refers to the relationship reflecting individuals' reliance on their smartphones to fulfill goals. People develop different relationships with their smartphones because they rely on their smartphones to fulfill different goals. Thus, smartphone dependency is regarded as a neutral concept that is based on the normal use of smartphone. However, smartphone addiction results from problematic smartphone use and refers to the excessive and pathological smartphone usage. People develop different kinds and intensity of dependency relationships with their smartphones; however, such dependency relationships are not necessarily problematic. Based on these fundamental differences, these two concepts should also be operationalized differently. Following the most of studies on the MSD theory, smartphone dependency is operationalized as the perceived helpfulness of a smartphone to an individual in meeting his/her goals (e.g., Ball-Rokeach, 1985; Grant et al., 1991; Patwardhan & Yang, 2003; Sun et al., 2008). However, smartphone addiction is operationalized as the demonstration of a number of clinically psychological and behavioral symptoms, such as withdrawal, preoccupation, and out of control, as much of technological addiction studies (e.g., Bian & Leung, 2015; Kim & Haridakis, 2009; LaRose et al., 2003; Park & Lee, 2011). Therefore, no matter from

conceptualization level or operationalization level, smartphone dependency and smartphone addiction are two different concepts in this dissertation.

Moreover, although a wealth of studies has investigated the topic of smartphone dependency, majority of them mainly centered on adolescents or university students (e.g., Lin et al., 2014; Lin et al., 2015; Park et al., 2013; Ting et al., 2011). As there is growing evidence show that smartphone dependency prevails among young working people (e.g., Alliance, 2013; Deal, 2013; Gartner, 2014), this dissertation aims to examine the smartphone dependency among this group of people, particularly focusing on their work-related smartphone dependency. Therefore, smartphone dependency in this dissertation is specifically defined as the relational state reflecting working people's reliance on his/her smartphone to meet various work-related goals.

To better understand the work-related smartphone dependency, in terms of its dependency relations, and antecedents and outcomes of such dependency relations, this dissertation employs the MSD theory as the theoretical underpinning. The following sections will discuss the assumptions and central propositions of MSD theory and elaborate how they inform my research.

2.4 Media System Dependency Theory

The reason for selecting the MSD theory to guide this dissertation is two-fold. First, the MSD theory has been widely used to understand the individual-media connections in the modern society (e.g., Kim, Jung, Cohen, & Ball-Rokeach, 2004; Lyu, 2012; Schulz, Zeh, & Quiring, 2005; Patwardhan & Yang, 2003; Sun et al., 2008; Tai & Sun, 2007). According to the thorough review of existing literature, majority of related research focusing on smartphone dependency have not yet been examined from

a theoretical point-of-view (e.g., Lin et al., 2014; Lin et al., 2015; Park et al., 2013; Suki & Suki, 2013; Ting et al., 2011). Using the MSD theory can provide a valid theoretical “lens” to understand smartphone dependency. The second reason relates to the objectives of this dissertation. This dissertation aims to explore three aspects of work-related smartphone dependency, including dependency relations, and the antecedents and consequences of such dependency relations. The MSD theory can perfectly guide me to peruse these objectives as it provides an encompassing framework that explains both the origins and effects of the media dependency relations. Based on the above reasons, the MSD theory was selected to guide this research.

2.4.1 Theory Overview

The MSD theory (Ball-Rokeach, 1985, 1988; Ball-Rokeach & DeFleur, 1976) grows out of the sociological school of human motivation. This theory has guided understanding of media dependency for several decades by positing that the relationship between the media and their audiences should be examined under the context of larger social systems (Ball-Rokeach & DeFleur, 1976). The major assumption of the theory is that the social system, mass media, and audience are interdependent in a state of “system” dependency (Ball-Rokeach, 1998). Media as the information systems manage information gathering, information processing, and information dissemination (DeFleur & Ball-Rokeach, 1989). Thus, as modern societies become more complex and change more rapidly, direct experience within interpersonal networks for information becomes limited, causing individuals to become dependent on the media to connect with societal institutions (Ball-Rokeach, 1976; Baran, & Davis, 2011; DeFleur & Ball-Rokeach, 1989).

In *Theories of Mass Communication*, DeFleur and Ball-Rokeach (1989) divided media dependency into two levels: the macro and the micro level (Ball-Rokeach, 1998; DeFleur, 1976). The macro-level deals with the relationships among various systems, including the media, economic, political, and all other societal systems, whereas the micro-level (individual-level) focuses on the relationship between an individual and his or her goals and media resources (Ball-Rokeach, 1985). Similar to much of the previous empirical research (e.g., Patwardhan & Yang, 2003; Sun et al., 2008), this study emphasizes on the individual-level analysis of smartphone dependency and examines the goal-related relational state built between individuals and their smartphones.

2.4.2 Individual MSD Relations

One basic assumption of the micro-level of MSD theory is that people establish dependency relationships with the media because they are goal oriented, and some of their goals entail the need to access resources that are provided by the media (DeFleur & Ball-Rokeach, 1989). Thus, media dependency relations rest upon goals on the one hand, and resources of the media on the other, and were reflected as individuals' dependence on media resources to meet their goals (DeFleur & Ball-Rokeach, 1989). By analyzing extensive studies regarding the goals attained by individuals through mass media use, Ball-Rokeach (1985) identified three key types of goals of individuals' mass media use, including understanding, orientation, and play. These three goals formed the key dimensions of an individual's MSD relations, namely understanding dependency, orientation dependency, and play dependency.

Understanding dependency refers to the relation wherein individuals depend on the mass media to understand themselves and become better acquainted with their

societies. As a society becomes larger, individuals actively seek out information and messages to understand the social environment and to assist them to act appropriately. The information resources from the media serve as the central avenue of understanding the society and its components (e.g., people, culture, and events). Hence, people depend on media to achieve understanding goals. Orientation dependency focuses on the relationship wherein individuals depend on mass media to guide their behaviors and take effective actions. For instance, individuals may rely on media information to guide behavioral decisions, such as purchasing goods or services, or depend on media resources to perform professional actions effectively. Play dependency refers to people's reliance on mass media to entertain or escape from reality. For instance, people may rely on a TV program to meet a personal goal of enjoyment or watch a dramatic movie to escape from frustrations in the real world. Ball-Rokeach (1985) pointed out that the three dependency relations were exhaustive but not mutually exclusive because some media might present numerous types of dependency relations. These relations are often correlated and more than one kind of dependency relations can be satisfied by the same medium. Moreover, the fulfillment levels of these goal-related dependency relations may vary by medium, media genre, and particular content (DeFleur & Ball-Rokeach, 1989).

2.4.3 Variations in Media Dependency Relations

The MSD theory offers a sociological approach to explain the variations in individual's media dependency relations (Ball-Rokeach, 1985). The theory argues that the type and intensity of individual media dependency relationship is largely determined by his or her social structural environment, which people do not have a

control of (Ball-Rokeach, 1985). That is, variations in individual-media dependency relations are the products of their surrounding social environments.

In particular, Ball-Rokeach (1985) pointed out two conditions in the social environment that are likely trigger the variations in media dependency relations: (a) the degrees of ambiguity and threat present in individuals' social environment, and (b) the activities of interpersonal networks. Ball-Rokeach (1985) argued that most people tend to develop heightened dependency on information resources provided by the media when prominent facets of their environment cannot be distinctly or adequately predicted or interpreted, specifically when the media are regarded as the "best" or "primary" information systems that exist. Threats in the environment can also intensify individuals' media dependency because people tend to depend on the media to signal, interpret, and organize responses to wars, crises, emergencies, and other potentially threatening situations. Thus, when individuals are involved in an ambiguous or threatening social environment, they are more likely to experience a higher degree of media dependency. Over the past decades, several studies have examined the increased intensity of media dependency relations in times of ambiguity or change (e.g., Avery, 2010; Fry, 1981; Hindman & Coyle, 1999; Kim et al., 2004; Lowrey, 2004; Lyu, 2012; Matsaganis & Payne 2005; Power & Ball-Rokeach, 1988; Schulz et al., 2005; Tai & Sun, 2007; Turner & Paz, 1986). For example, Hirschburg, Dillman, and Ball-Rokeach (1986) examined individual media behavior following the eruption of Mount Saint Helens, and found that in crisis situations, individuals' dependency on media was heightened to meet their understanding goals. Loges (1994) observed an increase in the intensity of media dependency relations with newspapers, radio, magazines, and televisions during conditions that threaten social and natural environments. Similar findings of increased dependency on the media were reported

by Hu and Zhang (2014) who studied the outbreak of AIDS crisis and media dependency. These studies provide evidence to support the view that individuals' dependence on the media will intensify when the degrees of ambiguity and threat are present in their social environment.

Additionally, the MSD theory emphasized that the behavior of interpersonal networks is also an important factor affecting individuals' media dependency (Ball-Rokeach, 1985). The theory argues that individuals are situated in various interpersonal networks, such as family, friends, and co-worker networks. The behavior of interpersonal networks may shape the individuals' media dependency relations by affecting their goals (Ball-Rokeach, 1985). Thus, when the main interaction activity of an individual's interpersonal networks changes, he or she will most likely adjust his/her attention priorities to ensure that effective and fulfilling interpersonal relationships are maintained.

To sum up, the MSD theory suggests that the ambiguity and threat present in individuals' social environment, and the activities of their interpersonal networks would influence individuals' media dependency.

2.4.4 Media Dependency Relations and Media Effects

The MSD theory also discusses the possible consequences of media dependency relations. Ball-Rokeach and DeFleur (1989) posited that the effects of the media on the audience are a function of how audiences are dependent on mass media to meet various goals. Thus, the intensity and nature of individual-media dependency relations can predict the likelihood of the media having both powerful and weak effects. The key assumption is that as people become more dependent on the media to satisfy their needs, the media becomes more valuable to them, and therefore the

stronger the effects the media will have on that person (DeFleur & Ball-Rokeach, 1989).

Ball-Rokeach and DeFleur (1976) pointed out that possible consequences of media dependency could be cognitive, affective and behavioral. Cognitive changes include the reduction or creation of ambiguity, effects on agenda setting, attitude formation, expansion of peoples' beliefs, as well as effects on people's values. Affective changes include an increase or decrease in audience's feelings and emotional responses (e.g., fear, anxiety, happiness, and satisfaction), because of dependence on information resources provided by the media. For instance, reliance on news messages or even television shows that depict cities as jungles ridden with violence may worsen people's fears and anxieties toward residing or even visiting cities. Effects to individuals' behaviors include individual activation and de-activation of the way they react behaviorally to a stimulus. For example, audience members would do something that they normally would not do, as a result of receiving media messages (Ball-Rokeach & DeFleur, 1976).

Extensive prior studies have employed the MSD theory to investigate various cognitive, affective and behavioral outcomes of media dependency, such as selective exposure (Ball-Rokeach, Rokeach, & Grube, 1984), newspaper readership (Loges & Ball-Rokeach, 1993), product purchases (Grant et al., 1991; Skumanich & Kintsfather, 1998), participation in public deliberation (De Boer & Velthuijsen, 2001), safe sex attitudes (Morton & Duck, 2000), political perceptions (Halpern, 1994), green-buying and civic engagement intentions (Ho, Liao, & Rosenthal, 2014), and voting decisions (Davies, 2009). One of the most ambitious research studies in this area is the Great American Values Test, which is a controlled field experiment conducted by Ball-Rokeach, Rokeach, and Grube (1984). This study found that a higher degree of

television dependency led to greater selective exposure to specific dependency-relevant television content, and more favorable post-exposure responses in terms of values, attitudes, and beliefs concerning racism, sexism, and environmental pollution. For example, depending on television to meet social and self-understanding goals was a significant determinant of whether people would choose to expose themselves to the experimental program. Higher degrees of dependency on television also led to more favorable responses to solicitations for contributions to social causes discussed in the program, as well as greater change in targeted values and attitudes regarding freedom and equality (Ball-Rokeach et al., 1984). With the proliferation of the Internet, some studies have also utilized the MSD theory to examine the consequences of Internet dependency. For example, Patwardhan and Yang (2003) surveyed 166 respondents randomly drawn from a large mid-western university in the United States and discovered that Internet dependency relations could significantly explain online shopping activities and online news reading. Targeting Spanish Internet users, Ruiz Mafé and Sanz Blas (2006) observed that the willingness of online consumption is determined by Internet dependency. These previous studies indicate that MSD theory is applicable for explaining the consequences of media dependency relations.

2.5 Media Dependency Relations in a Work-related Smartphone Media Context

This dissertation focuses on examining the media dependency relations in a smartphone media environment, particularly in a working context. According to the MSD theory (Ball-Rokeach, 1985), individuals develop three types of dependency relations with mass media, namely, understanding dependency, orientation dependency, and play dependency. However, it should be noted that these individual-media dependency relations were developed from the traditional mass media system,

and were based on the assumption that individuals depend on the media to provide information on their social environment (Ball-Rokeach, 1998). Unlike traditional media system where media controlled information gathering, information processing, and information dissemination, smartphone media ecosystem comprises a variety of “new” communication modes and functions. On the one hand, in the smartphone media system, individuals are no longer just as “passive receivers” to rely on it to provide them with the information on their social environment, but also actively use the smartphone platforms to gather, disseminate and communicate information. As individuals have more control of the information and as they participate in the process of producing and disseminating information in smartphone media environment, their relationship with the media should be more flexible and diverse. On the other hand, different from traditional mass media, such as newspaper and television, smartphone is a multifunctional new media platform that empower users to perform numerous activities and actions, such as taking photos, writing and editing documents, recording and documenting messages. The new communication mode and functionalities of smartphone media are likely to result in adjustment in the dependency relations between individuals and media. Moreover, the original individual-media dependency relations proposed by the MSD theory (Ball-Rokeach, 1985) were developed primarily from general life settings. When applying these dependency relations to a specific context, such as work setting, they may also entail some adjustments. Past studies have identified several specific goals of smartphone use at work, such as facilitating instant communication and cooperation among colleagues and clients, providing faster and more accurate access to work-related information, allowing flexible work organization and information sharing in real time, and solving clients’ queries and demands as well as providing feedback (Kossek & Lautsch, 2012; Kreiner et al., 2009; Lanaj et al.,

2014; Lee, et al., 2012; Mazmanian et al., 2006; Middleton, 2007, 2008). Thus, the first key objective of this dissertation is to extend the MSD theory to explore the types of dependency relations that young Chinese working adults developed with their smartphones at work.

2.6 Possible Factors Affecting Work-related Smartphone Dependency Relations

The second objective of this dissertation is to explore the antecedents affecting individual-smartphone dependency at work. According to the MSD theory, two conditions in the social environment could trigger the variations in media dependency relations (Ball-Rokeach, 1985).

The first condition is the degrees of ambiguity and threat present in people's social environment. Based on this, I infer that, under work settings, task characteristics could be antecedent factors that affect employee-smartphone dependency relations at work because different task attributes are likely to place employees into different levels of ambiguous or threatening work situations. For example, if individuals' work tasks require them to depend on others' efforts or information to accomplish, they may often be confronted with unpredictable or uncertain situations. Such work situations may heighten their dependency on smartphones because smartphones can best help them access information to remove uncertainties. Likewise, if employees' work task is time critical, they may often encounter urgent cases or threatening situations which need to be handled immediately. Under such situations, they may tend to develop intensified dependency relations with their smartphones because smartphones can help them respond to these emergencies immediately. By reviewing existing literature in communication and information management, three task characteristics (i.e., task

interdependence, task mobility, and time criticality) are proposed as possible antecedents of work-related smartphone dependency relations.

The second condition that could influence the variations in media dependency relations is the behaviors of interpersonal networks, according to the MSD theory. Based on this, I infer that organizational norm could be another antecedent factor that affects employee-smartphone dependency at work because organizational norms prescribe the ways wherein all organization members should approach their work and interact with one another. If one organization has a norm in using smartphones to handle work-related matters, members of this organizational network would behave in this way. Consequently, such smartphone usage behavior within the organization networks would intensify work-related media dependency relations of an employee. As such, organizational norm is expected to be another antecedent factor shaping the individual's media dependency relations.

Moreover, although the MSD framework mainly focuses on the social structural effects on individual-media dependency, Ball Rokeach (1985) contended that the variations in an individual's media dependency is also a function of personal psychological factors. In order to comprehensively understand the origins of the work-related smartphone dependency, this dissertation also attempts to explore if individual's psychological factors affect such dependency. Based on the review of existing research, I found two kinds of psychological factors are most likely to influence media usage and dependency, namely, self-efficacy and personality traits (e.g., Butt & Phillips, 2008; Chittaranjan, Blom, & Gatica-Perez, 2011; Eastin & LaRose, 2000; Hsu & Chiu, 2004; Lane & Manner, 2011; Livingstone & Helsper, 2009; Sun, 2004; Takao, 2014). Hence, I propose that smartphone self-efficacy and Big-Five personality traits, which capture most of individual differences in human

personalities (Goldberg, 1990; McCrae & John, 1992), may be the factors that influence individual's work-related smartphone dependency relations.

The following sections will illustrate these antecedent factors one by one through a review of related literature.

2.6.1 Task Characteristics

Although a “task” can be interpreted in various ways, this dissertation view a task in terms of what responses and behaviors the performer of the task should perform (Chung, Lee, & Choi, 2015; Hackman, 1969). With this perspective of a task, an organizational member's task may have several characteristics. Based on existing literature, I expect that three main task characteristics may affect employees' smartphone dependency at work, namely, task interdependence, task mobility, and time criticality.

2.6.1.1 Task interdependence

Task interdependence refers to the degree to which organizational employees depend on other members to accomplish the goal of the task (Sharma & Yetton, 2007). It is often measured by the need for coordination and cooperation with other organizational units (Malone & Crowston, 1994). Thompson (1967) pointed out that various forms of interdependence are observed in organizations, with each type calling for different coordination and cooperation mechanisms. When the interdependence of a task is low (e.g., taxi drivers, and telemarketing), employees can perform the task independently without need for interactions with other members. However, tasks that involve high levels of interdependence entail the need for high levels of information exchange to ensure the clarity of task assignments, devise effective task performance

strategies, arrive at decisions, and collect performance feedbacks (Andres & Zmud, 2002). Thus, when task interdependence increases, the amount of mutual adjustment, coordination and cooperation would increase in order to generate the desirable outcome (Gebauer, Shaw, & Gribbins, 2010). Tushman and Nadler (1978) suggested that increased needs for coordination and cooperation among organizational members would increase the need for more diverse information, thereby increasing the level of task uncertainty. Such job uncertainty could place employees in unpredictable or ambiguous situations.

Smartphones, which are especially helpful in information retrieval, search, and sharing, as well as in immediate communication and negotiation, can efficiently help workers remove ambiguities at work. Therefore, employees with high task interdependence could be reasonably expected to become dependent on their smartphones at work. Although no direct evidence shows that task interdependence affects smartphone dependency at work, some indirect indication can be found from previous studies. For instance, Staple and Jarvenpaa (2000) found that the importance for an employee to access to a mobile information system to perform a task is determined by the degree of task interdependence. Vinaja (2013) found that task interdependence was positively associated with mobile phone use for business communication and knowledge management. As such, task interdependence is proposed to be one possible antecedent that affects employee-smartphone dependency relations at work.

2.6.1.2 Task mobility

Task mobility is the second possible antecedent for work-related smartphone dependency. Task mobility reflects the extent to which a task is required to be

performed in different geographical places (Chung, Lee, & Choi, 2015; Kakihara & Sorensen, 2002). It is a task attribute that is often used to differentiate mobile workers from stationary office workers (Yuan, Archer, Connelly, & Zheng, 2010). In contrast to stationary office workers, mobile workers must work in a dynamic mobile environment. When they are mobile, workers are usually involved with changing and unpredictable environment (e.g., location, time, people, activity, and surrounding physical environment) that render them unable to foresee the specific situations that they will be confronted with or the kind of resources that will be accessible to them (Brown & O'Hara, 2003). Therefore, they often need to adapt to high levels of unpredictability related to these contexts (Yuan & Zheng, 2006). For instance, when a worker has to work in a variety of locations, he or she may be confronted with appointment changes and cancellations, traffic jams, flight delays, and unknown locations. At these times, managing the uncertainty of the work is their key concern (Brown & O'Hara, 2003). Smartphone, as a portable sophisticated technology, can be extremely helpful for them because it enables them to be aware of and deal with the changes and uncertainties, and consequently to make the optimal arrangements while they are away from their desktop computers (Yuan et al., 2010). As such, employees with higher levels of task mobility are more likely to develop dependency relations with their smartphones at work, compared with those with lower levels of task mobility.

2.6.1.3 Time criticality

Time criticality is another task attribute that may trigger work-related smartphone dependency. Time criticality denotes the importance of time in task performance, which can be viewed from to the extent that job tasks must be performed

promptly (Ballard & Seibold, 2004; Yuan et al., 2010). Previous studies show that when the job tasks are time critical, employees often encounter unexpected events or urgent tasks that must be handled immediately (Yuan et al., 2010). Such emergencies can easily place workers into unpredictable and threatening environments. At these times, smartphones might be helpful for these workers because extant studies show that mobile technologies could facilitate rapid feedback (Jarvenpaa, Lang, Takeda, & Tuunainen, 2003), enable immediacy (Keng, Lim, & Shen, 2001), and support emergency services (Liang & Wei, 2004; Yuan & Zhang, 2003). Since smartphones can assist in responding to emergency situations immediately, it is expected that employees dealing with time critical tasks have a higher likelihood of developing smartphone dependency relations at work.

2.6.2 Organizational Norm

In addition to task characteristics, organizational norms pertaining to smartphone use at work can be one potential antecedent that intensifies employees' work-related smartphone dependency. Norm refers to beliefs on how people should think and behave (Homans, 1992; Stamper, Liu, Hafkamp, & Ades, 2000). It is manifested in different forms, such as documents, oral communication, or behavior, to be upheld, propagated, and adhered to (Stamper et al., 2000). Theory of interpersonal behavior suggests that norms within referent groups serves as a pressure that compels members of the group to behave or think in a certain way (Moody & Siponen, 2013; Stamper et al., 2000). In this research, the norms are studied under the organizational context refer to unwritten rules that dictate the ways in which all organizational members should perform their job and relate with one another (Hammer, Saksvik, Nytrø, Torvatn, & Bayazit, 2004; Stephens & Davis, 2009). According to the MSD

theory, the behavior of interpersonal networks may shape the individuals' media dependency relations by affecting their goals (Ball-Rokeach, 1985). Since organizational norm prescribes the ways wherein all organization members should approach their work and interact with one another, it is expected to be an antecedent factor affecting individual's smartphone dependency at work.

Although no exiting research has examined the association between organizational norm and smartphone dependency, some studies in wide variety of social settings can indirectly support this argument (e.g., Burger & Shelton, 2011; Hsu & Lu, 2004; Kowalewski, Henson, & Longshore, 1997; Lea & Spears, 1991; Mollen, Rimal, Ruitter, & Kok, 2013; Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008; Reid, Cialdini, & Aiken, 2010; Schepers & Wetzels, 2007). For instance, in an observational research to study the effects of social norm on day-to-day health behaviors, Burger and Shelton (2011) found that social norm significantly decreased the percentage of people who took the elevator compared with those who took the stairs to go up one or two floors. Relating to organizational settings, studies have also shown that the norms in people's work settings can impact their tendency to engage in certain behaviors (D'Abate 2005; Liberman et al., 2011; Lim & Teo, 2005; Martin et al., 2010; Postmes, Spears, & Lea, 1998). For instance, Postmes, Spears, and Lea (1998) found that, in an organization where many employees used emails for informal communication at work, other employees are likely to conform to this norm and start using emails for communication. Martin et al. (2010) found that, in an environment where many employees participate in non-work related activities, other employees are likely to emulate these behaviors because of the norm. These findings suggest that norm is a critical factor that influences behaviors of social groups. Smartphones have been increasingly used in current workplaces for various work-related goals (Kossek

& Lautsch, 2012; Kreiner et al., 2009; Major & Germano, 2006). Following the vein of past research and the MSD theory, if one organization had a norm for the use of smartphones for work-related matters, members of this organizational network would tend to depend on smartphones at work. Thus, I infer that organizational norm is one possible antecedent that affects work-related smartphone dependency.

2.6.3 Psychological Factors

Based on the review of existing literature, I propose that individuals' smartphone self-efficacy and Big Five personality traits are the potential antecedents affecting their work-related smartphone dependency relations

2.6.3.1 Smartphone self-efficacy

Individual's smartphone self-efficacy is the first influential factor that may affect their smartphone dependency at work. Smartphone self-efficacy stems from the concept of self-efficacy, which was developed from Bandura's (1986) Social Cognitive Theory (SCT). Bandura (1986) defines self-efficacy as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (p. 391). According to the SCT, self-efficacy is a prominent predictor of people's behaviors because an individual can exhibit a certain behavior only if they consider themselves to be capable of performing such behavior (Bandura, 1977). Thus, people characterized with high levels of self-efficacy tend to perform related behavior (Bandura, 1982). Over the years, self-efficacy has been examined in several areas of study, thereby generating a range of domain-specific measures, such as mathematical, reading, and ICT self-efficacy (Baker & Wigfield, 1999; Moos & Azevedo, 2009; Pajares & Miller, 1994; Tsai, Ho, Liang, & Lin, 2011).

Given that previous studies suggest that domain-specific measures of self-efficacy provide more accurate forecasts for performance compared with general measures (Hsu & Chiu, 2004; Saleem, Beaudry, & Croteau, 2011), using smartphone self-efficacy measures should be the preferred approach over general efficacy measures. Therefore, in this dissertation, individuals' self-efficacy belief specifically targets smartphone use defined as personal beliefs regarding one's ability to use a smartphone to perform various actions (Eastin & LaRose, 2000).

Extant empirical research has indicated that self-efficacy in the use new media technologies (e.g., computer, Internet, and mobile phone) affected individual's actual usage and dependency (e.g., Agarwal, Sambamurthy, & Stair, 2000; Bright, Kleiser, & Grau, 2015; Chen, Yen, Chen, 2009; Davis, Bagozzi, & Warshaw, 1989; Delcourt & Kinzie, 1993; Durndell & Haag, 2002; Eastin & LaRose, 2000; Hsu & Chiu, 2004; Lee & Hsieh, 2009; Marakas, Yi, & Johnson, 1998; Olivier, & Shapiro, 1993; Sun, 2004; Venkatesh & Davis, 2000; Wang, Jackson, Wang, & Gaskin, 2015; Zubrow, 1987). For instance, in a study of UK teenagers' use of the Internet, Livingstone and Helsper (2009) observed that Internet self-efficacy was significantly associated with the amount of time online daily and frequency of Internet use. They concluded that individuals who considered Internet as too complex and believed that they could never control it would avoid using it. Park and Chen (2007) found that smartphone self-efficacy has a significant effect on the adoption decision for smartphones among medical doctors and nurses. Chen, Yen, and Chen (2011) found that smartphone self-efficacy belief positively predicted employees' intentions to adopt smartphone technology in a delivery service company. Relating to media dependency, one previous MSD study conducted by Sun (2004) found that Internet self-efficacy intensified Internet dependency relations of American college students. These findings

suggest that if one individual perceived himself/herself as capable of using and controlling a new media technology, he or she will be more willing to adopt it, and therefore develop intensifying dependency on it. In this vein, it is logistic to infer that smartphone self-efficacy affects individuals' work-related smartphone dependency.

2.6.3.2 Big-Five personality traits

Besides, extensive studies have shown that several personality traits can significantly affect the use and dependency of various media technologies (Amichai-Hamburger, Wainapel, & Fox, 2002; Amiel & Sargent, 2004; Birnie & Horvath, 2002; Butt & Phillips, 2008; Chittaranjan et al., 2011; Delevi & Weisskirch, 2013; Hamburger & Ben-Artzi, 2000; Lane, & Manner, 2011; Takao, 2014; Thayer & Ray, 2006; Tosun & Lajunen, 2010). For example, Bianchi and Phillips (2005) found that extraverts, disagreeable, and unconscientious people spend more time calling and sending text messages. Ezoë et al. (2009) found that scores for extraversion and neuroticism were positively associated with the levels of mobile phone dependency. Zhong (2013) observed that highly ICT innovative individuals spent more time on mobile media devices than those with low ICT innovativeness. Lin, Chiang, and Jiang (2015) demonstrated that the level of sociability of smartphone users was positively related to their smartphone dependency. Many of these personality traits can be reduced to one of the Big-Five personality traits: extraversion, agreeableness, conscientiousness, neuroticism, and openness to new experience. Therefore, in this research, I suspect that these Big-Five personality traits, which capture most of individual differences in human personalities (Goldberg, 1990; McCrae & John, 1992), may affect work-related smartphone dependency relations.

Extraversion refers to the depth and intensity of interpersonal interactions (Goldberg, 1990). Extraverts are always energetic to the outside world and able to be described as sociable, active, and talkative. Previous research shows that extraverts are more likely to turn to a form of Computer-Mediated Communication (CMC) technology to engage with other people to satisfy their unmet offline social needs as compared with people who are regarded as introverts (Bargh, McKenna, & Fitzsimons, 2002). Smartphone is one type of CMC technology that enables employees to communicate and discuss with other colleagues or clients. Thus, they may find the use of smartphone is appealing, and consequently develop a dependency on it.

Neuroticism is defined as the tendency to be emotionally unstable (Ehrenberg, Juckes, White, & Walsh, 2008). Neurotic individuals often feel anxious, sad, and are sensitive to others' responses. Previous studies have found that neurotics often feel distress because of the rejection that may happen in face-to-face contacts (Peters & Malesky, 2008). As a CMC platform, smartphones offer neurotic individuals the opportunity to escape potentially stressful face-to-face interactions (McElroy, Hendrickson, Townsend, & DeMarie, 2007). Thus, if one employee is neurotic, he or she may find the smartphone to be helpful, thereby developing dependency on it.

Agreeableness refers to the degree of cooperation, compliance and modesty (Anastasi & Urbina, 1997). Agreeable people are prosocial and friendly to others, while disagreeable individuals are principally less enjoyable to others, argumentative, uncooperative, and harsh (John, Laura, & Christopher, 2008). Previous studies show that disagreeable individuals are more likely to experience undesirable social interactions in offline settings (Engelberg & Sjöberg, 2004; Peters & Malesky, 2008).

Therefore, they may find communicating with others via smartphone for work-related purposes to be easier, thereby developing dependency relationship with it.

Conscientiousness is characterized by competence, achievement, self-discipline, and dutifulness (Anastasi & Urbina, 1997). Conscientious individuals can control their impulses and strive to achieve goals (John et al., 2008). Previous studies found that individuals scoring high in conscientiousness are prone to be more serious, responsible and cautious towards work, and rely heavily on analyzing the available information in order to make a decision because they are less willing to take risks (Korzaan & Boswell, 2008; Walczuch & Lundgren, 2004). Conscientiousness was identified as the strongest of the Big Five traits in its influence on individuals' behaviors and performance at work settings (Ones & Viswesvaran, 1999). As smartphones can keep employees always connected to their work and enhance their job performance, conscientious workers are likely to develop dependency on their smartphones at work.

Openness to experience shows the extent of a person's intellectual curiosity, ingenuity, and penchant for novelty. Individuals who are open to new experiences are normally willing to try new things. As smartphones are gradually being used in the work domain, employees with high levels of openness tend to have positive attitudes and rely on this job-related technology to a certain extent because of their inclination to welcome novel approaches to performing their job.

Based on the above discussion, I infer that these five personality traits (i.e., extraversion, neuroticism, agreeableness, conscientiousness, and openness to experience) may affect individual's work-related smartphone dependency.

2.7 Possible Outcomes of Work-related Smartphone Dependency Relations

The last objective of this dissertation is to explore the consequences of work-related smartphone dependency relations. According to the MSD theory, the dependency relations between user and media would result in cognitive, affective and behavioral outcomes. By reviewing existing literature in the related area, I posit that the outcomes of smartphone dependency at work may relate to workers' job performance, workplace social capital, and smartphone addiction symptoms. The following sections will describe these possible outcomes one by one by reviewing related literature.

2.7.1 Job Performance

The first consequence of work-related smartphone dependency relations may lie in the job performance of employees. The concept of job performance is defined as whether individuals perform their jobs well (Winter, 1980). In general, job performance is a multidimensional construct closely associated with work productivity and efficiency, profit, and goal accomplishment, and is viewed as an important criterion for organizational success (Downs & Moscinski, 1979).

Smartphone, as one of the newest multifunctional new media tool in the workplace, enables employees to conveniently perform various activities for work, such as receiving or replying work emails, reading and editing work files, documenting work-related materials, accessing to online work-related information, and contacting co-workers and clients. Previous studies have shown that smartphone use can significantly increase workers' job performance. For instance, Pitichat (2013) found that smartphone use can greatly facilitate organizational communication and collaboration so as to indirectly enhance the work efficiency and productivity.

Middleton (2007) found that the BlackBerry smartphones can allow employees to complete their job tasks more efficiently by supporting them to perform their work irrespective of time and space. Such autonomy could make employees feel better, consequently allowing them to complete their job tasks more efficiently. Moreover, previous studies on mobile enterprise systems have suggested that by using the work-related apps on smartphones, workers in an organization are able to remotely access and update enterprise databases regardless of where they are or the time of the day, which can largely stimulate and increase users' efficiency and effectiveness in terms of various task-related issues under different situations (e.g., Chung, Lee, & Kim, 2014; Hutton, 2013). If an employee had strong dependency relations with their smartphones at work, such dependency relations would intensify his/her smartphone use for work purposes. Consequently, the job performance of such employee is likely to be enhanced by the increased work-related smartphone use. As such, it is reasonable to expect that work-related smartphone dependency relations may result in better job performance.

2.7.2 Workplace Social Capital

The second possible effect of work-related smartphone dependency is related to employees' workplace social capital. Workplace social capital refers to a resource that shows the nature of social relations within a firm and is actualized via employees' levels of collective goal orientation and shared trust (Leana & Van Buren, 1999). It usually consists of three key dimensions, namely, social network ties, shared goals, and trust (Chung, Cooke, Fry, & Hung, 2015; Chow & Chan, 2008; Hau, Kim, Lee, & Kim, 2013; He, Qiao, & Wei, 2009). Over the past several years, extensive studies have employed the concept of workplace social capital to examine and understand

organizational phenomena and interpersonal associations in the work domain (e.g., Chow & Chan, 2008; Hau, Kim, Lee, & Kim, 2013; He, Qiao, & Wei, 2009; Nahapiet & Ghoshal, 1998; Wasko & Faraj, 2005). Workplace social capital has been acknowledged to be an asset that can benefit both the organization (e.g., creating value for shareholders) and its employees (e.g., enhancing employee skills).

Given that the key function of mobile phones pertains to social connection, extant previous studies reveal that mobile phone use can contribute to increasing social capital (e.g., Campbell & Kwak, 2010; Chan, 2015; Ling, 2004; Wei & Lo, 2006). For instance, Campbell and Kwak (2010) found that voice calling and text messaging can significantly strengthen people's social relations because such mobile activities significantly increased social interactions. Moreover, mobile phones have been found to be especially beneficial in satisfying weak ties as they shorten the time and reduce the monetary costs of cultivating relationships with a relatively large number of people, such as colleagues from work (Ellison, Steinfield, & Lampe, 2007).

Smartphones represent the most recent generation of mobile phones. If employees are heavily dependent on smartphones for work-related purposes, such dependency relations may inadvertently boost their work-related smartphone use. Increased work-related smartphone use could likely strengthen workplace social capital. For instance, increased communication and discussion on work-related matters through smartphones can help in maintaining colleague-to-colleague relationships and contribute to a better understanding of their shared goals at work, thereby enhancing workplace social capital. Being always connected to work and responding immediately to colleagues' requests via smartphones could build up or strengthen trust among organizational members, thereby increasing workplace social capital. As such, it is logistically to

expect that work-related smartphone dependency may increase young workers' workplace social capital.

2.7.3 Smartphone Addiction

Work-related smartphone dependency may lead to undesirable outcomes as well, such as the emergence of addiction symptoms. As discussed in the previous chapter, smartphone addiction and smartphone dependency are two different concepts in this dissertation. Smartphone dependency refers to the relational state that reflects individuals' reliance on smartphones to achieve various goals. It is a neutral concept representing the relationship between users and their smartphones. However, the conceptualization of smartphone addiction primarily follows in the vein of technological addiction (a subset of behavioral addiction) and is defined as excessive and pathological human-machine interaction (e.g., Bian & Leung, 2015; Leung, 2008; Park & Lee, 2011; Walsh et al., 2008). Addicted smartphone users feel an urge to consume media regardless of the potentially adverse consequences that makes the persistent consumption of media seem irrational or out of control (LaRose et al., 2003). Thus, smartphone addiction is considered to be a negative and pathological concept that is measured by psychological and behavioral symptoms (e.g. Bian & Leung, 2015; Kwon, Kim, Cho, & Yang, 2013; Lee, Chang, Lin, & Cheng, 2014; Park & Lee, 2014).

Smartphone addiction can be detrimental to employees and organizations as it would lead to impaired concentration and decreased productivity (Chicago Tribune, 2012; Ray, 2015; Seals, 2015). In nowadays, with the intensifying dependency relationship between employees and their smartphones for work reasons, a growing number of working people are reported to have smartphone addiction symptoms. For

instance, a global survey of 1,800 young workers found that 60% of them experienced smartphone addiction symptoms, such as checking their smartphones compulsively during the day and feeling anxious if they could not use their phones constantly at work (Fortt, 2012). Smartphone addiction of organizational workers was also evidenced in many anecdotes and news reports (e.g., Alliance, 2013; Chicago Tribune, 2012; CNBC, 2012; TechNewsWorld, 2007; Tencent, 2015). In this dissertation, I expect that relying on smartphones at work could be a reason triggering smartphone addiction symptoms. According to the MSD theory, the more dependent an individual is on a medium to fulfill needs, the more important the medium becomes to the individual (DeFleur & Ball-Rokeach, 1989). When an employee perceives smartphones as being extremely important for their work, he or she would pay particular attention to it and would be highly involved with its usage. Consequently, some addiction symptoms associated with smartphone use would appear. For instance, individuals may experience negative feelings (e.g., anxious and unsettled) when unable to use the smartphone; they may excessively check their smartphone's status throughout the day; or they may be preoccupied on the smartphone when performing other tasks. As such, I infer that the more employees dependent on their smartphones at work, the more likely they would have smartphone addiction symptoms.

To summarize, based on MSD theory and existing literature, several factors that may affect the work-related smartphone dependency and possible consequences of such dependency were proposed in this Chapter. Specifically, I infer that three task characteristics (i.e., task interdependence, task mobility, and time criticality), and organizational norm may affect work-related smartphone dependency of young workers. Regarding the consequences, I expect that relying on smartphones at work may lead to better job performance and strengthened workplace social capital, and, at

the same time, may result in the emergence of undesirable smartphone addiction symptoms. In the next Chapter, I will discuss the research objectives and methods of Study 1, which was used primarily for examining whether these proposed factors could really apply to my research on the work-related smartphone dependency of young working adults in China, and whether I missed out some important information.

CHAPTER THREE

OBJECTIVES AND METHODS (STUDY ONE)

In Chapter 2, I suggested some possible antecedents and consequences of work-related smartphone dependency based on the MSD theory and existing literature in various contexts. Given that no prior study has specifically investigated the topic of smartphone dependency at work, especially in the Chinese context, I am uncertain whether all these factors could apply to my research on young working adults in China and whether I overlooked some important factors. In order to develop a valid research model to explicate the antecedents and consequences of work-related smartphone dependency relations of young Chinese workers, and to lay a solid foundation for the hypotheses and instruments development of the next survey study, I firstly conducted an exploratory study (Study 1) by interviewing 32 young workers in Mainland China. Chapter 3 will describe the research questions of Study 1, and then provide details on the research design and employed method for it.

3.1 Objectives and Research Questions

The central purpose of Study 1 is to explore the dependency relations that young Chinese workers develop with their smartphones at work, and the antecedents as well as consequences of such dependency relations. As such, the following three research questions were proposed in Study 1:

- 1) What kinds of dependency relations that young Chinese workers develop with their smartphones at work?
- 2) What are the antecedents that influence these work-related smartphone dependency relations of young Chinese working adults?

3) What are the consequences of these work-related smartphone dependency relations of young Chinese working adults?

3.2 Research Design and Rationale

A qualitative research design was utilized to explore the research questions in Study 1. The rationale for selecting a qualitative approach is two-fold. First, the holistic focus of qualitative method can help researchers to achieve a more profound, unrestrained, and more flexible understanding of the target group's experiences, with higher levels of openness and capability to adapt to change as inquiry goes deeper (Duffy, 1987; Patton, 2002). Second, qualitative research is capable of discovering trends and variations, which can engender the development of hypotheses, formulation of theories, and institutionalization of practice (Fegran, Hall, Uhrenfeldt, Aagaard, & Ludvigsen, 2014). Given no prior research has investigated the work-related smartphone dependency of young working adults in China, qualitative research design should be an adequate approach to enable me to obtain rich and unconstrained information about this topic, and lay foundation for the development of the research model, and constructing the research questions, hypotheses, and instruments for next survey study.

Semi-structured interviews (Eriksson & Kovalainen, 2008) were the data collection method employed in this qualitative research. The benefits of carrying out semi-structured interviews are to guarantee to cover the predetermined set of the interview questions, yet remain open for relevant follow-up questions (Berg & Lune, 2012; Eriksson & Kovalainen, 2008). Researchers can inquire further in accordance to participants' preliminary answers through follow-up questions, encouraging them to provide further explanation and clarification, thus gaining potentially newer or more

profound understanding with regard to their feelings and perceptions (Creswell, 2013; Wimmer & Dominick, 2011). As such, semi-structured interview should be an adequate data collection method for this study which explores the dependency relations, the antecedents and consequences of work-related smartphone dependency of young Chinese working adults.

3.3 Participants and Sampling

As mentioned in the Chapter 1, this dissertation focuses on examining the work-related smartphone dependency among young working adults aged from 18 to 35 in mainland China. As such, the specific sampling criteria include (1) full-time workers in mainland China; (2) aged from 18 to 35 years old; (3) with experiences of using smartphones for work reasons. All interviewees were recruited via my personal networks by using a purposive sampling technique, a widely-used nonprobability sampling technique in interview studies (Berg & Lune, 2012; Marshall, 1996). The reason for employing purposive sampling method is that it can help me recruit “preferred participants” in accordance to their ability to elucidate on the phenomenon being studied (Creswell, 2007). Specifically, to represent diverse perspectives, young workers with different professions, gender, and places in China were purposefully recruited.

In terms of the sample size, the present study used the criterion of data saturation to guide data collection. Data saturation points to a situation in which data does not present new properties of core theoretical categories anymore nor provide insight into the issues under investigation (Strauss & Corbin, 1998). The data collection was completed when no additional valuable information could be further

generated from interviews, thereby reaching data saturation (Morgan, 1998). I found that the point of saturation has been reached when I had the 32nd interviewee.

The following Table 1 listed the profiles for all 32 participants. They were 17 males and 15 females, and aged between 24 years old and 34 years old (M=28.09, SD=2.79). These participants were young workers in various industrial sectors in mainland China (e.g., IT, education, media, healthcare, telecommunications, finance and manufacturing).

Table 1. Interviewee Profile

No.	Age	Gender	Profession	Industry	Location
1	34	Male	IT Manager	Telecom	Beijing
2	30	Female	Business Developer	Manufacture	Beijing
3	28	Male	IT Engineer	IT	Shenzhen
4	30	Male	Salesperson	Manufacture	Shenzhen
5	26	Female	Teller	Education	Yunnan
6	28	Male	Accountant	Government	Beijing
7	28	Female	Project Officer	Tourism	Beijing
8	26	Female	Admin Officer	Tourism	Yunnan
9	26	Female	Program Director	Media	Beijing
10	25	Female	Teacher	Education	Heilongjiang
11	31	Male	Salesperson	Advertising	Shanxi
12	26	Female	Teacher	Education	Yunnan
13	28	Female	Sales Executive	Manufacture	Zhejiang
14	26	Female	Salesperson	Construction	Shanxi
15	33	Male	Engineer	Manufacture	Beijing
16	33	Male	Manager	Manufacture	Zhejiang
17	30	Male	Manager	Telecom	Beijing
18	26	Female	Admin	Tourism	Yunnan
19	25	Male	Salesperson	New technology	Shanghai
20	31	Female	Lawyer	New Energy	Beijing
21	26	Male	Media Planer	Advertising	Shanghai
22	29	Male	Manager	Education	Xian
23	24	Female	Auditor	Accounting	Heilongjiang
24	28	Male	Editor	Media	Shanxi
25	26	Male	Doctor	Healthcare	Sichuan
26	33	Male	Manager	Telecom	Shanxi
27	26	Female	Futures Trader	Finance	Beijing

28	29	Female	IT Engineer	IT	Shenzhen
29	25	Male	Customer Manager	Media	Beijing
30	27	Male	Project Officer	Education	Shanghai
31	31	Male	Salesperson	Telecom	Beijing
32	25	Female	Reporter	Media	Beijing

3.4 Data Collection

Semi-structured interviews were conducted during February to March 2015. Potential participants were initially screened by the above selection criteria and contacted via WeChat (“微信” in Chinese) to describe the study and make an appointment for a face-to-face interview or an online Skype interview. Prior to commencing each interview, I spent around 3 to 5 minutes explaining the study to the participant. If the respondents had any questions regarding the study, the questions were addressed.

In the interview process, an interview guide with a set of open-ended questions was used (see Appendix A). Interviews began with some warm-up questions to obtain information about respondents’ smartphone usage patterns, and serve to get them to start thinking about the smartphone dependency at work. Questions included how often they use smartphones at work, what smartphone functions they used most frequently, and to what extent they think they are dependent on their smartphones at work. Following these warm-up questions, three groups of questions targeting on 1) work-related smartphone dependency relations, 2) their possible antecedents, 3) their consequences, were asked. These questions were predominantly developed from the research questions and literature review in Chapter 2. Specifically, questions of each group began with general ones (e.g., “Based on your experience, why do you become dependent on your smartphones at work?”), then moved to specific ones (e.g., “Are

you often required to cooperate or coordinate with others in order to finish your work? If yes, does this task characteristic intensify your smartphone dependency at work?). On the one hand, interviewing the respondents with such questioning order can help me obtain unconstrained information about respondents' experiences on their dependency relations, antecedents, and consequences, so as to identify if there are some critical factors I missed out in the literature review section. On the other hand, it allows me to examine whether the possible antecedents and consequences proposed in the literature section is really applicable in my dissertation. Lastly, the interview ended up with some demographic questions.

During the interview processes, follow-up questions were asked in response to participants' answers. Since all informants felt more comfortable with Chinese, interviews were conducted in this language. The interview guide was translated from English to Chinese (see Appendix B for the Chinese version of the interview guide). Each interview lasted for approximately 40 minutes and was audio-recorded using my mobile devices (i.e., tablet or smartphone).

3.5 Ethical Consideration

Before data collection in February 2015, the approval was obtained from Institutional Review Board (IRB) of Nanyang Technological University (*Reference No.: IRB-2014-12-013*) (Appendix E). Informed consent was obtained verbally before interviewing (see Appendix C for the English version of consent form; see Appendix D for the Chinese version of consent form). Participants were informed of their voluntarily participation and assured that their responses would be only used for academic and publication purposes. Their personal information and transcripts would be kept confidentially, and any information that can reveal personal identities would

be removed during data reporting. Participants who successfully completed the interviews were given \$SGD10 as a token of appreciation. Notably, for the participants interviewed via Skype, they were given \$SGD10 via WeChat “Electronic Red Envelop” application as a token of appreciation.

3.6 Data Analysis

The interview data were analyzed using the qualitative thematic analysis approach (Patton, 2015), which can be used to describe interview content and interpret findings by formulating themes. The data analysis process was executed in several steps.

First, the audio recordings were transcribed verbatim, with the help of a PhD student whose mother tongue is Chinese. Before commencing transcription work, I briefed this transcriber on the purpose of the study, common terms used by the interviewees, and the required format for the interview transcripts. After the transcription, I double checked all transcripts against audiotapes and corrected the mistakes for ensuring all interviews were transcribed as recorded. This process is necessary as it can contribute to the reliability of the study (Gibbs, 2007).

Second, all transcripts were imported into the NVivo 10 (QSR International Pty Ltd, Doncaster, Australia), a computer assisted qualitative data analysis software, for conducting the coding process. The NVivo software helped me organize my data based on each interview and keep my coding process organized. With repeated reading of the interview transcripts, words, phrases, and sentences, which are relevant to the research questions, were coded. Then, the codes were streamlined and narrowed into different themes. A provisional coding frame was developed based on the research questions and the literature reviews, consistent with many qualitative studies (Bazeley,

2013; Warren & Karner, 2005; Wimmer & Dominick, 2011). However, in the coding process, additional codes and themes were added and improper codes and themes were deleted in the codebook. For instance, since no data was coded for supporting the theme of “play dependency”, a media dependency relation proposed by original MSD theory (Ball-Rokeach, 1985, 1988; Ball-Rokeach & DeFleur, 1976), the prepared codes and theme regarding “play” concept was deleted in the final codebook. Meanwhile, although I did not prepare the codes and themes for “managerial support” in the original coding frame, I added them into the codebook because several data were identified for supporting them. The final coding results were presented in the Table 2.

Notably, although the interview coding was performed by myself, I applied several strategies to ensure the credibility and reliability of the coding results. First, I used a peer debriefing strategy to ensure the credibility of the coding results. That is, the coding process, development of emerging themes, and composition of the results report was reviewed and examined by another graduate student whose research mainly centered on health communication. This peer debriefing process can greatly contribute to the credibility of data analysis (Spall, 1998). Second, after the initial coding, I conducted a critical deliberation with my supervisor to ensure the accuracy, consistency, and relevance of the codes for thematic analysis (Asgary et al., 2015). Third, to examine if other researchers would code the same data the same way (Campbell, Quincy, Osserman, Pedersen, 2013), I also checked intercoder reliability of the coding. After I finished coding the first four transcripts, another graduate student was hired to re-code them in NVivo software. Then, two coding outputs were compared by using the “Coding Comparison” query provided by NVivo. The value of Cohen’s Kappa is used for determining the inter-rater coding reliability (McHugh,

2012). The result shows that Cohen's Kappa is .76, which is greater than the recommended value .70 (Caceres, 1993), suggesting that my coding achieved acceptable inter-rater reliability.

The last step was to interpret and present the coding results. The coding results were analyzed in reference to the existing literature and the research goals. The most revealing quotes were selected to illustrate the findings. To keep interviewees' identities confidential, their names were concealed and showed as "Respondent XX (number)" in the results section.

To sum up, this Chapter explained the research objectives of Study 1 and the research process that was undertaken. It carefully documented the sampling and recruitment, and data collection and analysis procedures to which this study has adhered. Next chapter will present the findings of this qualitative interview study and provide a brief discussion about how these findings inform the development of the research model and design of Study 2.

Table 2. Themes and Codes

Primary Themes	Secondary Themes	Codes
Dependency Relations	<p>understanding <i>(Definition: depending on smartphones to understand work-related matters)</i></p>	<ul style="list-style-type: none"> • stay informed • keep up with recent information • figure out information
	<p>orientation <i>(Definition: depending on smartphones to guide work-related behaviors or take effective work-related actions)</i></p>	<ul style="list-style-type: none"> • write/edit files • gather materials • calculate numbers • record information
	<p>communication <i>(Definition: depending on smartphones to communicate or interact with others for work purposes)</i></p>	<ul style="list-style-type: none"> • maintain contact others • discuss work-related issues • interact with others
Task Attributes	<p>task interdependence <i>(Definition: the extent to which job tasks need to be accomplished by depending other members)</i></p>	<ul style="list-style-type: none"> • frequent coordination • frequent cooperation
	<p>task mobility <i>(Definition: the extent to which job tasks need to be performed in different locations)</i></p>	<ul style="list-style-type: none"> • frequent business travels • frequent outside work • flexible work location
	<p>time criticality <i>(Definition: the extent to which job tasks needs to be performed promptly)</i></p>	<ul style="list-style-type: none"> • urgent cases • Prompt response
Organizational Factors	<p>organizational norm <i>(Definition: unwritten rules that dictate the ways in which all organizational members should perform their job and relate with one another)</i></p>	<ul style="list-style-type: none"> • normal to use smartphone • popular trend to use smartphones
	<p>managerial support <i>(Definition: perceive managers are supportive to smartphone use for work)</i></p>	<ul style="list-style-type: none"> • encourage smartphone use • subscribe mobile phone cornet service • provide phone bill allowance

Psychological Factors	smartphone self-efficacy (<i>Definition:</i> personal beliefs regarding one’s ability to successfully use smartphones)	<ul style="list-style-type: none"> • high level of proficiency • successfully to do whatever I want • no need to put mental effort
	conscientiousness (<i>Definition:</i> the personality trait of being thorough, careful, or vigilant.)	<ul style="list-style-type: none"> • well-organized • responsible • dutiful • careful
Positive Consequences	job performance (<i>Definition:</i> personal perception regarding whether he or she perform their jobs well)	<ul style="list-style-type: none"> • increase work efficiency • improve work quality
	workplace social capital (<i>Definition:</i> a resource that reflects the nature of social relations within the organization)	<ul style="list-style-type: none"> • strengthen the work relationship • build “we are together” feeling • enhance the trustiness
Negative Consequences	smartphone addiction (<i>Definition:</i> excessive and pathological user-smartphone interaction)	<ul style="list-style-type: none"> • withdrawal • silence • inability to control craving

CHAPTER FOUR RESULTS (STUDY ONE)

The purpose of Study 1 is to explore the dependency relations young Chinese workers developed with their smartphones at work, as well as the antecedents and outcomes of such dependency relations. To achieve these goals, I conducted an exploratory study by interviewing 32 young workers in various professional sections in Mainland China. This Chapter will analyze the interview findings to address the following research questions:

- 1) What kinds of dependency relations that young Chinese workers develop with their smartphones at work?
- 2) What are the antecedents that influence these work-related smartphone dependency relations of young Chinese working adults?
- 3) What are the consequences of these work-related smartphone dependency relations of young Chinese working adults?

After presenting the findings, a brief discussion about the how the findings of Study 1 inform the development of the research model will be presented.

4.1 Interview Results

As described in the method section, 32 young workers in various industrial sectors in mainland China (e.g., IT, education, media, healthcare, telecommunications, finance and manufacturing) participated my interviews. They all considered smartphone as an indispensable tool in their work. In addition to voice calling and Short Messaging Services (SMS), these interviewees used mobile WeChat and mobile emailing most frequently at work. When I asked them to what extents they feel they are dependent on smartphone at work, around 27 out of 32 respondents perceived

themselves highly dependence on their smartphone at work. For instance, a 28-year-old sales executive (Respondent #13) stated that, “If you ask me to rate my dependency level on a 0 to 100 scale, my score is at least 80. I am highly dependent on it at work.” The following sections will present the interview findings regarding the above three research questions regarding dependency relations, antecedents, and consequences successively.

4.1.1 Dependency Relations

In this section, the first research question of Study 1 regarding the dependency relations that young Chinese workers develop with their smartphones at work was addressed. According to the MSD theory, goals are considered the key dimensions underlying people’s media dependency relations (Ball-Rokeach, 1985). The coding results show that young Chinese workers were dependent on their smartphones to meet various work-related goals, such as keeping informed about work-related matters, contacting colleagues or clients, searching work-related information, taking notes and performing various work-related actions. Based on identified goals, I categorized work-related smartphone dependency relations into three dimensions: understanding dependency, orientation dependency, and communication dependency. Understanding dependency refers to the relation that individuals depend on their smartphones to understand their work-related matters. Orientation dependency refers to the relation that individuals depend on their smartphones to perform effective actions at work. These two dependency relations were consistent with the original media dependency relations classified by the MSD theory (Ball-Rokeach, 1985; Ball-Rokeach et al., 1984). Communication dependency is the new identified dependency relation, indicating users’ reliance on smartphones for communicating and interacting with their

colleagues and clients. The following section will describe how my interview data support each of these dependency relations.

4.1.1.1 Understanding

Relying on smartphones to understand work-related matters is the first key dependency relation that young employees developed with their smartphones at work. More than two-thirds of respondents reported that they were frequently dependent on their smartphones to stay on top of what was happening at work and keep up with recent work-related messages. For instance, a 34-year-old IT manager in a telecommunications company (Respondent #1) stated that he was highly dependent on his smartphone to keep informed about work-related information as all of his company's announcements or notifications were transmitted via Short Message Service (SMS). "Without smartphones, I would have no idea of what was happening at work," he stated. Another example comes from a 25-year-old female journalist who demonstrated that smartphone is especially important for her because she need to rely on it to know the latest news in the society. She said that:

"I have to keep up with what is happening outside. I have installed various news APPs in my smartphone, such as Sina News and Tencent News. Whenever big news breaks, these applications would pop up notifications immediately. Smartphone is very helpful for my work." (Respondent #32)

Apart from keeping abreast with their work, five respondents considered their smartphones as alternatives to desk computer and depended on them for finding out work-related information. According to a young orthopedics doctor (Respondent #25), "When I am checking my patients in the wards, there is no computer around. Whenever I face some questions regarding medication, I would depend my

smartphone to figure them out, such as search related information online.” Similarly, a 28-year-old female employee in textile manufacturing industry (Respondent #13) also indicated the following, “Smartphone is very important to me because it helped me to stay informed and find out the latest fashion trends in the textile industry.” These discussions show that young Chinese workers develop dependency relation with their smartphones for meeting understanding goals at work. Therefore, understanding dependency is the first kind of work-related smartphone dependency relations of young Chinese workers.

4.1.1.2 Orientation

Orientation is another type of goals that Chinese employees depended on their smartphones to achieve. The coding results revealed that orientation is mainly reflected in the dependence of young employees on their smartphones to effectively perform work-related actions, such as writing/ editing work-related files, gathering materials, calculating data, and recording important information. One news reporter (Respondent #32) stated that, “When I am interviewing outside, I need to rely on my smartphone take notes. Sometimes, when the interviewing equipment are not nearby, I also need to depend on my smartphone to record the interview process and take pictures of my sources.” Another example comes from a sales lady (Respondent #14) who often relied on smartphone to answer customers’ queries and provide them with quotations for her decorations. She expressed that:

“I often go to my customers’ apartments to sell them my products. Bringing a calculator in my visits is very inconvenient. I instead rely on my smartphone whenever I need to calculate something, such as the decoration area and quotation.” (Respondent #14)

With regard to employees' dependency on smartphones to record work-related information, three respondents described smartphones as important gadgets in saving the contact numbers of their work colleagues or clients. As indicated by a cashier in a vocational school (Respondent #5), "Most of my colleagues' phone numbers are recorded in my phone. I rarely memorized them. Without my smartphone, I could not get in touch with them easily." Moreover, a young media worker (Respondent #29) described that he relied on the memo feature of his smartphone to task notes on important information or tasks. He said, "Whenever I came across new ideas or schedule important appointments, I would type them on my smartphone." The above evidences indicate that young Chinese workers develop dependency relation with their smartphones for achieving orientation goals at work. Therefore, orientation dependency is the second type of work-related smartphone dependency relations of young Chinese workers.

4.1.1.3 Communication

Depending on smartphones to facilitate communication and interaction with their colleagues and clients is the new dependency relation identified in this study. Almost all respondents emphasized the indispensable role of smartphones in maintaining their contacts with their colleagues and clients. As indicated by a 34-year-old IT manager (Respondent #1), "Face-to-face communication or discussion becomes increasingly unpopular in the current business world because it costs a lot of time, energy, and money. Smartphones provide us with an efficient and economical way to contact each other. That's why more and more people become dependent on it at work." Another example comes from a middle-level worker in a state-owned

enterprise who especially depend on the WeChat service of smartphone to meet communication needs at work. He expressed the following:

“I frequently rely on WeChat to discuss work projects with my partners or subordinates. We also have a specialized company-based mobile APP for internal real-time communication, such as sending/ receiving company email and conducting teleconferences. We frequently discuss work-related issues with one another using this smartphone application even if we are working in different countries.” (Respondent #26)

Besides, some respondents expressed that smartphones helped them interact and share work-related information with their co-workers and customers. One typical example comes from a female salesperson (Respondent #14) who has established a WeChat group with all her previous and potential customers. She said, “During holidays, I would post my best wishes in the group and interact with the other members. Whenever my company launches a promotion, I would also share the promotion news with the group members and even post discount codes in our group. Therefore, smartphone is a really important platform for me to communicate and interact with my customers. I am highly dependent on my phone.” The abovementioned evidences reveal that young Chinese workers develop dependency relation with their smartphones for meeting communications goals at work. Therefore, communication dependency is the third kind of work-related smartphone dependency relations of young Chinese workers.

To sum up, the coding results shows that young Chinese workers mainly developed three kinds of dependency relations with their smartphone at work, including understanding, orientation, and communication. Therefore, the first research question of this interview study was answered. The following sections on task attributes, organizational norm, and managerial support are to answer the second

research question of Study 1 regarding the antecedents of smartphone dependency at work.

4.1.2 Task Attributes

As for the antecedents, many respondents attributed their work-related smartphone dependency to their task characteristics. As indicated by one interviewee (Respondent #19), “My task attributes determined I have to depend on my smartphone at work.” Specifically, consistent with my expectation, three key task characteristics (i.e., task interdependence, task mobility, and time criticality) were found to affect the work-related smartphone dependency of young employees in China. In the following sections, I will illustrate how the interview data support these three task attributes as the antecedents.

4.1.2.1 Task interdependence

Task interdependence is a key job attribute that identified to affect work-related smartphone dependency. It was primarily reflected in the coordinating and cooperating needs of work tasks. Fourteen interviewees indicated that they depended on smartphone mainly because their jobs required to frequently coordinate with others. For instance, one European-tours organizer (Respondent #7) in a travel agency demonstrated that her job often involves frequent coordinating among many people and departments to make sure that the trip would go well, and such task attribute greatly increased her dependency with smartphone at work. She expressed, “If a customer quits during the tour, the local tour guide in Europe need to contact me immediately. Then, I must contact the hotel to change the reservation and then call the flight company to cancel the tickets. These coordination works are normally conducted

by relying on my smartphone.” Likewise, a media professional who produced promotional videos for many companies also ascribed his smartphone dependency to his coordination tasks. He stated the following:

“Every time my customers propose new requirements or ideas for the video, they contacted me to discuss such ideas. Afterward, I need to contact our technical group and discuss whether such ideas can be implemented. If they are workable, I have to negotiate with the customer about the required time and budget... My work generally revolves around these coordination tasks. Accomplishing these work tasks, I have to frequently rely on the help of my smartphone.” (Respondent #29)

Besides, slightly less than half of the participants reported that their job involved frequent cooperation with colleagues and/or clients, thereby driving their smartphone dependency. For instance, one IT engineer (Respondent #3) who often needs to cooperate with a lot of colleagues around the world for accomplishing joint projects stated that, “My work cannot be performed fairly independent of others. I have to work closely with my colleagues and cooperate with them. Such task characteristics determined I have to be dependent on my smartphone keep in contact with them and exchange information with them.” The above discussions indicate that young Chinese workers are likely to develop dependency relations with their smartphones at work when their job tasks are interdependent with others. Therefore, task interdependence is the first task attribute identified to influence dependency relations between young Chinese workers and their smartphones at work.

4.1.2.2 Task mobility

Task mobility is the second job characteristic that increased young workers' smartphone dependency at work. Three types of task mobility were distinguished, namely, frequent business travels, work outside frequently, and flexible working locations. Regarding frequent business travels, six respondents reported that their work requires them to travel frequently, thereby increasing their work-related smartphone dependency. As expressed by one telecom manager (Respondent #17) whose job involves high mobility, "Whenever I travel outside, my smartphone is my primary tool for dealing with my work tasks. I rely on smartphone to receive and send emails, download work-related documents, and deal with emergent cases. Therefore, my work-related smartphone dependency increases greatly during my travel."

Additionally, 14 respondents stated that their job often required them to work in locations outside of their offices, such as in the offices of their clients or in other locations, thereby intensifying their dependence on smartphone. For examples, one respondent stated the following:

"My job is to sell new technology products to others. I have to go to different places every day to promote our products. Because of this high mobility nature, I have to heavily depend on my smartphone to receive the information and contact my colleagues." (Respondent #19)

Similarly, a junior auditor (Respondent #23) who was often assigned to go to different companies to check their auditing accounts also attributed her smartphone dependency to her highly-mobilized work. She revealed, "When I am working in different locations outside of my offices, I have to heavily rely on my smartphone to keep in touch with my colleagues and receive information. That's why I have to make sure that my smartphone is always with me and with enough battery power."

Besides, one young IT engineer (Respondent #28) also attributed her smartphone dependency to her flexible working locations. This respondent stated that she does not have to go to office every day. As long as she can finish the assigned tasks, she can work at home, in a coffee house, or anywhere she wants. Just because of such flexible task characteristic, smartphone turned out to be very important to her because she has to rely on it to keep contact with her colleagues and bosses and receive work-related messages.

These discussions indicate that young Chinese workers are likely to develop dependency relations with their smartphones at work when their job tasks need to be performed in different locations. Therefore, task mobility is the second task attribute identified to affect work-related smartphone dependency relations of young Chinese workers.

4.1.2.3 Time criticality

The interview data also identified time criticality as a key job attribute that influences work-related smartphone dependency of young employees. Time criticality is mainly manifested in the urgency (the extent to which the tasks needs to be performed promptly) of job tasks. Twenty out of the 32 respondents reported that their urgent work increases their dependence on their smartphones. Two young employees, a journalist and a television program director, emphasized that timeliness is the most important thing in their work. They have to be on call 24 hours and have to attend to their work promptly whenever their smartphones notify them of any urgent news. Similarly, a young doctor also stressed the significant role of urgency in increasing his smartphone dependency. He stated:

“We are required to keep our smartphones on for 24 hours. If my department received any emergency, the nurse on duty would call me. Regardless of location, date, and time, I have to come back to the operating room instantly to attend to a life-and-death issue. The patient cannot wait.” (Respondent #25)

For those respondents who seldom confront urgent cases in their work, their tasks that required prompt responses also increased their smartphone dependency. A young project officer (Respondent #30) who worked in a consultation company stated that his work required him to keep smartphone on and in full power 24/7 because whenever their clients need consultation, he has to respond to them straightway. “Our job performance is largely determined by our prompt responses to our customers and our timely provision of the best solution to their problems. We have immediately attend to work once our smartphone rang. Such time critical nature of our job tasks determined that we would develop strong dependency relationship with our smartphones.”, he said. Another example comes from a mechanical engineer (Respondent #15) who is required to respond to the constructor’s questions promptly regarding his design drawings. He expressed,

“In the construction process, if the constructors had any problem or were confused by my design, I have to respond to them and resolve their problems immediately. If they cannot find me, all the construction members—sometimes we have dozens of constructors—have to stop their work, thereby delaying the construction. To avoid such delay, I have to rely on my smartphone to keep always connected with my work.” (Respondent #15)

The abovementioned evidences demonstrated that young Chinese employees are likely to develop dependency relations with their smartphones at work when their

job tasks are time critical. As such, time criticality is the third tasks attribute identified to influence work-related smartphone dependency of young Chinese workers.

In sum, the coding results revealed that task attributes, including task interdependence, task mobility, and time criticality are the antecedents that influence the work-related smartphone dependency relations of young Chinese workers.

4.1.3 Organizational Norm

Consistent with my expectation, organizational norm regarding smartphone use at work is identified as one powerful contributor to such dependency. Twenty-two young employees reported that it is normal to use smartphones to handling work-related matters in their companies. As indicated by a young project officer (Respondent #30) who heavily relies on his smartphone for work-related communication. He described, “In my company, using smartphone to contact one another is conventional. Whenever there is a problem at work, my colleagues directly call me via smartphones. They seldom use emails or face-to-face communication. Such norm undoubtedly exaggerates my dependency relationship with smartphone.”

Meanwhile, 25 respondents mentioned that using smartphones at work becomes a popular trend in their organizations. For example, Respondent #27 stated that his company has a work-related mobile WeChat group and his colleagues enjoy updating their work progress and discuss work matters in this group. “Because of this trend, I have to rely on my smartphone to receive their information and participate the discussion,” he said. Similarly, another respondent also attributed his smartphone dependency to such norms among his colleagues. He described the following:

“My colleagues enjoy using smartphone WeChat group to discuss about work-related matters. Sometimes, our boss also distributes new tasks or assignments directly via this group.

Although joining this WeChat group is not compulsory, I would never know what my colleagues are talking about if I refuse to use this smartphone application. Therefore, to stay on top of what was happening at work, and maintain effective and satisfying interpersonal associations at work, I have to rely on my smartphone.” (Respondent #20)

In short, the above interview evidences indicated that organizational norm is an influential antecedent that influences the work-related smartphone dependency of young Chinese workers.

4.1.4 Managerial Support

Apart from the abovementioned job attributes and organization norm, which were expected by the researcher, many respondents also pointed out the significant influence of managerial support on their dependence on smartphones at work. Twenty-two young employees mentioned that their management are supportive to their smartphone usage for work reasons. Specifically, two forms of supports are identified. The first form is subscribing a mobile phone cornet service for all organization members. For instance, Respondent #26 who is always supported by his company to use smartphone for work stated that,

“For all of our organization members, we can easily call one another by just dialing a short number on our smartphones, such as 611 and 612, without charge. This service is free and convenient. We definitely become rely on our smartphones for contacting one another.” (Respondent #26)

The other form of managerial support is providing a phone bill allowance for their employees. One example was provided by the following young project officer

who thought that his company's management team is sure of the benefits that can be achieved with the smartphones:

“If we can fix the client's problem over the phone, our management always encourages us to use our smartphones to save cost. To encourage us to use our smartphones to finish our work as much as possible, our company agrees to reimburse all our smartphone bills. I think, such supports from our management indirectly intensifies our reliance on smartphones for handling work-related matters.” (Respondent #30)

Thus, the coding results of the Study 1 revealed that managerial support for smartphone use is another organizational antecedent affecting work-related smartphone dependency relations of young Chinese workers.

4.1.5 Individual Factors

To comprehensively understand the antecedents of work-related smartphone dependency, my interviews also attempted to explore if some of the psychological dispositions also affect Chinese workers' smartphone dependency at work. I asked some interview questions on the influences of psychological factors, such as smartphone self-efficacy and big-five personality traits. However, the coding results revealed that only smartphone self-efficacy and one of the big-five personality traits, namely, conscientiousness, influenced such dependency. The following sections will describe how my interview data support these two individual traits as antecedents.

4.1.5.1 Smartphone self-efficacy

Smartphone self-efficacy, which refers to individuals' personal belief in their ability to successfully use smartphones to perform various actions, is the first

significant personal factor identified to influence employees' reliance on smartphones for work. More than half of the interviewees mentioned that they depended on smartphones at work mainly because they thought they have a high level of proficiency in smartphones use. A 33-year-old engineer demonstrated this relationship through the following comment:

“I am dependent on my smartphone at work simply because I feel that it is easy to use. As I can easily get my smartphone to do what I want to do, I have come to rely on it, whether for personal purposes or for work-related purposes.” (Respondent #15)

It was similarly described by another employee who often relies on his smartphone to perform work tasks. He stated that, “If I did not think I am proficient in using my smartphone functions or felt them difficult to use, I would not rely on my phone to deal with my work tasks.” (Interviewee #26)

Moreover, some respondents depended on smartphones at work mainly because they considered that using smartphone to execute courses of action does not require them to put much mental effort. According to a young worker (Interviewee #29), “With the technological development, most of smartphones are very easy to use. Even my mum, a 60-year-old lady, could use most of the functions of her smartphone effortlessly. Since using smartphone does not require me to spend much mental effort, I definitely become depend on my smartphone at work.” Accordingly, young workers' smartphone self-efficacy is the first psychological antecedent of their smartphone dependency at work.

4.1.5.2 Conscientiousness

Conscientiousness is characterized by carefulness, responsibility, self-discipline, and dutifulness. Twenty Chinese workers attributed their work-related smartphone dependency to their personality of conscientiousness. “I am a very conscientious person and take my work tasks seriously. I want everything to be well organized and in a good rate of progress. My smartphone is what enables me stay on top of what is happening at work and monitor the project progress conveniently. That’s why I developed strong dependency on it,” commented a business developer in a car company (Interviewee #2). Similarly, a 33-year-old manager in a telecom company regarded himself as a reliable and cautious person and indicated the following:

“My works are involved with a lot of urgent cases. I cannot allow (work-related) problems to happen due to my own carelessness or irresponsibility. Thus, I hold my smartphone all the time and rely on it to stay connected with my work. Whenever my colleagues call me, I respond to them immediately and handle the matters.” (Interviewee #26)

A sales representative (Interviewee #14) described the relationship between conscientiousness and smartphone dependency as follows: “When I come across problems and unclear matters regarding my work, I want to figure it out immediately...I don’t like to delay things ... A smartphone is very helpful to me, especially when I’m out of the office. For instance, I can use it to call for help from others or to search for related information online (e.g., Baidu),” she said.

The above interview demonstrates that the dependency relations between young workers and their smartphones at work are not only a function of the social-structural factors at work but also influenced by their individual psychological factors.

In particular, this study identifies employees' task attributes (i.e., task interdependence, task mobility, and time criticality), organization norm, management support, smartphone self-efficacy, and conscientiousness, as the antecedents of their work-related smartphone dependency. Thus, the second research question of this interview was resolved.

4.1.6 Consequences

In this section, the last research question of Study 1 regarding the outcomes of work-related smartphone dependency is answered. The coding results show that work-related smartphone dependency resulted in both positive and negative outcomes. The positive outcomes include better job performance and strengthened workplace social capital. The undesirable consequence is the emergence of smartphone addiction symptoms. The following section will demonstrate how my interview data support these three consequences.

4.1.6.1 Job performance

The most frequently mentioned positive effect of Chinese employees' smartphone dependency at work lies in their job performance. Twenty-seven interviewees stated that relying on their smartphones at work greatly increased their work efficiency. For instance, a salesperson who relies on his smartphone to communicate and negotiate with long-distance customers emphasized that:

“With the help of my smartphone, I don't have to regularly drive to or fly to my customers' location to discuss work matters face to face. I can conveniently talk to them and negotiate with them using voice calling or the video conferencing function of my smartphone. It saves me a lot of

time and energy, and tremendously increases my work efficiency.” (Interviewee #19)

Some interviewees indicated that their reliance on their smartphones to perform work activities enabled them to use their time wisely and consequently increased their work efficiency. According to a 28-year-old IT manager (Interviewee #3), “Thanks to my smartphone, I can deal with my work tasks and reply to work emails anytime and anywhere...like when I’m waiting for a shuttle bus or taking a two-hour train ride...To some extent, it has greatly improved my work efficiency.” A similar example was provided by a primary school teacher who relies on her smartphone to create or edit class materials. She said:

“My smartphone helped me make good use of my fragmented time. For example, I often rely on my smartphone to edit my class syllabus or slides when I wait for my girlfriends while they try on clothes in the shop. It has really increased my work efficiency.” (Interviewee #10)

Moreover, some respondents indicated that smartphone dependency improved their work quality. On the one hand, smartphones can help them remove uncertainty at the work as avoiding uncertainty tends to make them commit mistakes at work. A young auditor (Interviewee #23) stated: “With the help of my smartphone, whenever I have uncertainty or a question regarding my work, I can immediately call or WeChat my colleagues for help. My phone enabled me to avoid making mistakes at work.” On the other hand, a respondent who works in the consultation industry (Interviewee #30) mentioned that his smartphone enabled him to promptly respond to his customers’ questions, and thus his service quality was greatly improved. He said: “The timely response to our customers’ questions and requests is the determinant of job performance in the consultation industry. With the help of my smartphone, I can

always connect to my customers and respond to their requests. Therefore, it significantly improved my work quality.”

The above discussions prove that work-related smartphone dependency increases young workers’ job performance. Therefore, job performance is the first consequence of such work-related smartphone dependency relations.

4.1.6.2 Workplace social capital

Strengthening workplace social capital is the second consequence of work-related smartphone dependency identified in this study. The coding results show that Chinese employees’ work-related smartphone dependency relations increased their workplace social capital, which is reflected from three dimensions. First, over 20 respondents mentioned that relying on their smartphones for interaction and communication at work helped them to maintain or strengthen their work relationship with their colleagues. As indicated by a 33-year-old mechanical engineer (Interviewee #15), “With the help of my smartphone, I can directly communicate work-related issues with my work partners and colleagues. Through frequent emails, messages, and voice calls on our smartphones, we become more familiar with each other and close to each other, thereby strengthening our relationship.” Another salesman (Interviewee #4) provided a similar response: relying on his smartphone to maintain frequent work-related discussions and communication among colleagues tremendously increased their mutual understanding at work. “The more we understood each other, the tighter our relationship became,” he said. In particular, one respondent pointed out that such dependency enhanced her relationship with her boss. She said:

“Thanks to my smartphone, especially the WeChat function, I can report the work progress and discuss work-related matters with my boss in an easier and more relaxed way. For instance,

I often use cute WeChat moji to express my opinions during our discussion. Sometimes, my boss replies to me some amusing ones ... In this way, I feel that my relationship with my boss is getting better and relaxed.” (Interviewee #28)

Second, 14 interviewees stated that smartphone dependency at work created a “we are together” feeling in the workplace, and it increased their enthusiasm about achieving the goals and missions of the organization. According to a telecom manager, “With the help of smartphones, every organizational member got connected with each other at work. We share the work information and update our work progress with each other every day. It really gives us a ‘we are together’ feeling in the workplace and makes me become more enthusiastic about achieving the goals of the company.” Another example comes from a female project officer who described that relying on smartphone, especially its WeChat service, for sharing and discussing work-related matters with co-workers gave her the feeling of being together and promoted her working consensus and enthusiasm. She expressed the following:

“Whenever we were confronted with difficulties at work, we would look for help through this WeChat group on smartphone. Whenever there was an emergency at work, we would discuss the measures and coordinate the task instantly in this group ... it really makes me felt that we are a team and that ‘we are fighting together’ in the organization.”
(Interviewee #7)

Finally, some indicated that smartphone dependency at work also helped them to build trust among organizational members. As indicated by a business developer in a car company (Interviewee #7), “With the help of my smartphone, I could deal with my colleagues’ requests instantly. As my colleagues found that I can timely respond and handle their problems, they would think that I am a reliable partner at work,

thereby mutual trust being built.” Another respondent who worked in an accounting company (Interviewee #23) described a similar effect: “With the help of my smartphone, I am always connected at work. Whenever there is an emergency, I can get informed and respond to it immediately. Therefore, my boss considers me a reliable employee.” This evidence indicates that young workers’ workplace social capital is enhanced by their dependency relationships with their smartphone. Therefore, workplace social capital is the second desirable consequence of work-related smartphone dependency.

4.1.6.3 Smartphone addiction

Aside from the abovementioned positive outcomes, some employees also indicated that their work-related smartphone reliance made them start to have smartphone addiction symptoms, such as withdrawal, silence, and inability to control their craving. In terms of withdrawal symptoms, 30 young workers reported that heavily relying on smartphones at work led them to have negative feelings (e.g., anxiety, unsettle, and panic) when they could not use their smartphones. For instance, a 27-year-old male project manager whose job involved high mobility in a large educational institution commented the following:

“My work requires me to travel a lot. In most situations, my smartphone is the only thing I can rely on to get information and to stay on top of what is happening at work. Thus, whenever my phone is out of range for a while, I would become nervous and start worrying about my colleagues or clients looking for me because of an emergency...”

(Interviewee #30)

Another example comes from a young doctor (Interviewee #25) who often needed his smartphone to search for work-related medical information and documenting

important work materials. He revealed, “My smartphone is very important for my work. If it ran out of battery, I would definitely be freak out. Therefore, I charge it every night and never allow it to go below the 20% battery charge.”

With respect to the silence symptom of smartphone addiction, 24 respondents admitted that their work-related smartphone dependency made them frequently and uncontrollably check their smartphone status throughout their daily activities. According to a 30-year-old business developer (Interviewee #2) who relied on his smartphone for receiving messages and checking emails at work, “I check my phone every one or two minutes uncontrollably because I’m afraid of missing any important message from my customers.” The coding results also revealed that this work-related smartphone dependency made these workers think about their smartphones all the time. A sales executive (Interviewee #13) stated that even if she was doing important tasks and her two hands were busy, she still could not help but think about her smartphone and if any new messages had come in.

Moreover, some young Chinese workers also indicated that their reliance on their smartphones for work-related purposes made them unable to control their craving for their smartphones. This reaction resulted in complaints from their families and friends. For instance, a 29-year-old IT engineer (Interviewee #28) who relied on her smartphone for keeping up with work-related events and recoding work tasks revealed that her mum often scolded her for spending too much time her smartphone. Similarly, another young media worker said that he received many complaints from his girlfriend about his smartphone use at work:

“Relying on my smartphone to receive updated news and to stay on top of what is happening in our society is an extremely normal thing for a news editor like me. However, such dependency sometimes makes me unable to control the time I

spend on smartphone. My girlfriend used to complain about it many times when we were dating.” (Interviewee #24)

Overall, the discussion above proves that relying on smartphones at work indeed result in various consequences on workers. On the positive side, such dependency help young workers perform better at work and strengthen workplace social capital. On the negative side, it causes them to experience smartphone addiction symptoms. Therefore, job performance, workplace social capital, and smartphone addiction are the three key consequences of work-related smartphone dependency identified from Study 1. Thus, the last research question of Study 1 was addressed.

4.2 Implications for Research Model Development

The central purpose of Study 1 is to explore work-related smartphone dependency in terms of its dependency relations, antecedents, and consequences among young Chinese workers, and therefore to develop a solid research model and lay the foundation for my Study 2.

Through in-depth interviews with 32 young workers from mainland China, this study found that young Chinese workers mainly developed three kinds of dependency relations with their smartphones at work, including understanding dependency (depending on smartphones to understand work-related information), orientation dependency (depending on smartphones to perform work-related activities), and communication (depending on smartphones to communicate work-related matters with others). The names of the first two types of dependency relations are consistent with the original individual–media dependency relations categorized by Ball-Rokeach (1985). The third one, communication, is the new dependency relation identified in this study. This result supports my speculation about the changes in dependency relations in the smartphone media environment where individuals not only depend on

media to provide information about their social environment but also depend on it to communicate and share information, as well as perform a wide variety of activities. Moreover, “play,” an original key media dependency relation (Ball-Rokeach, 1985), is not identified in this study. The reason for not observing play dependency relation mainly because that participants’ smartphone behavior is mostly instrumental at work setting. Since this study focused on the smartphone dependency at work, it is reasonable that I did not found the play dependency relation from the data. This also supports my expectation that not all the original media dependency relations categorized by Ball-Rokeach (1985) can be applied in a specific working context. Therefore, for a study centering the work-related smartphone dependency, “play” is not included in my research model as a key smartphone dependency relation, based on the interview results.

Regarding the antecedents, the results of Study 1 are consistent with my expectation that work-related smartphone dependency is influenced by employees’ task attributes (i.e., task interdependence, task mobility, and time criticality) and organizational norm. These findings indirectly support MSD theory, which posits that the media dependency of individuals is determined by their social structural factors (Ball-Rokeach, 1985). Therefore, all three task attributes and organizational norm are included in the research model as antecedents.

In addition to these expected antecedents, Study 1 identified a new organizational factor (i.e., managerial support) affecting work-related smartphone dependency relations. It shows that supports from their companies’ management also intensified employees’ dependence on smartphones at work. Managerial support can be considered a type of social support, which involves the flow between people of emotional concern, instrumental aid, or appraisal (Leung & Lee, 2005). Although no

study investigated the relationship between managerial support and smartphone dependency, previous study shows that managerial support was positively related to employees' intentions to use new media technologies, such as Internet (Chang & Cheung, 2001; Liberman, Seidman, Mckenna, & Buffardi, 2011; Pee, Woon, & Kankanhalli, 2008) and smartphones (Kim, 2008). Since Study 1 identified managerial support as an influential antecedent of work-related smartphone dependency relations, it is added to my research model for further examination.

Moreover, consistent with my expectation, Study 1 found that the formation of work-related smartphone dependency relations is also a function of individual psychological factors. Notably, although I proposed five personality traits (extraversion, neuroticism, conscientiousness, agreeableness, and openness) and smartphone self-efficacy as the possible antecedents, only conscientiousness and smartphone self-efficacy were identified from the data. This results is somewhat unsurprising as my study specifically centered on the smartphone dependency at work settings. Extant scholarships show that conscientiousness is the most valid and important personality trait of Big-Five factors in work settings because it represents the personal characteristics such as responsible, careful, persistent, and hardworking, which are important attributes for completing work tasks in all jobs (Barrick & Mount, 1991; Hertz & Donovan, 2000; Ones & Viswesvaran, 1999). Thus, when we examine employee's reliance on smartphones for achieving work-related goals, conscientiousness should be a more valid predictor than other four personality traits. In light of this, only smartphone self-efficacy and conscientiousness are included in the research model as the antecedent factors.

As for the consequences, the interview results of Study 1 supported my expectation that such dependency relations lead to better job performance,

strengthened workplace social capital, and trigger the emergence of undesirable smartphone addiction symptoms. Thus, job performance, workplace social capital, and smartphone addiction are considered outcome variables in the research model.

More importantly, the results of Study 1 also revealed that these antecedent variables seem to trigger different kinds of smartphone dependency relations at work. And, different dependency relations seem to result in different consequences. For instance, some interviewees mentioned that their interdependent task attribute led them to highly depend on their smartphones to facilitate work-related communication or discussion, whereas some described that their time critical task attribute led them to rely on their smartphones to understand work-related information. Regarding the consequences, the enhanced workplace social capital is more likely to be affected by employees' communication dependency, while smartphone addiction seems to be led by understanding dependency. Therefore, examining the prediction power of antecedents in each specific dependency relation and examining the influences of each specific dependency relation in all three consequences are necessary for the in-depth understanding of the antecedents and consequences of work-related smartphone dependency. Therefore, my research model not only examines the antecedents and consequences of the overall intensity of work-related smartphone dependency but also investigates the antecedents and consequences of each specific dependency relation.

Based on the aforementioned discussion, an integral research model is proposed (see Figure 1). The heart of the model lies in the overall intensity of the work-related smartphone dependency and the intensity of each specific dependency relation (i.e., understanding, orientation, and communication). The antecedents of overall dependency intensity and the intensity of each specific dependency relation are the task characteristics (i.e., task interdependence, task mobility, and time criticality),

organizational factor (i.e., organizational norm and managerial support), and individual psychological factors (i.e., smartphone self-efficacy and conscientiousness). The consequence variables are job performance, workplace social capital, and smartphone addiction. Study 2 will use a quantitative research design to statistically examine the relationships proposed in this model. The next chapter will illustrate the specific research objectives and method employed by Study 2.

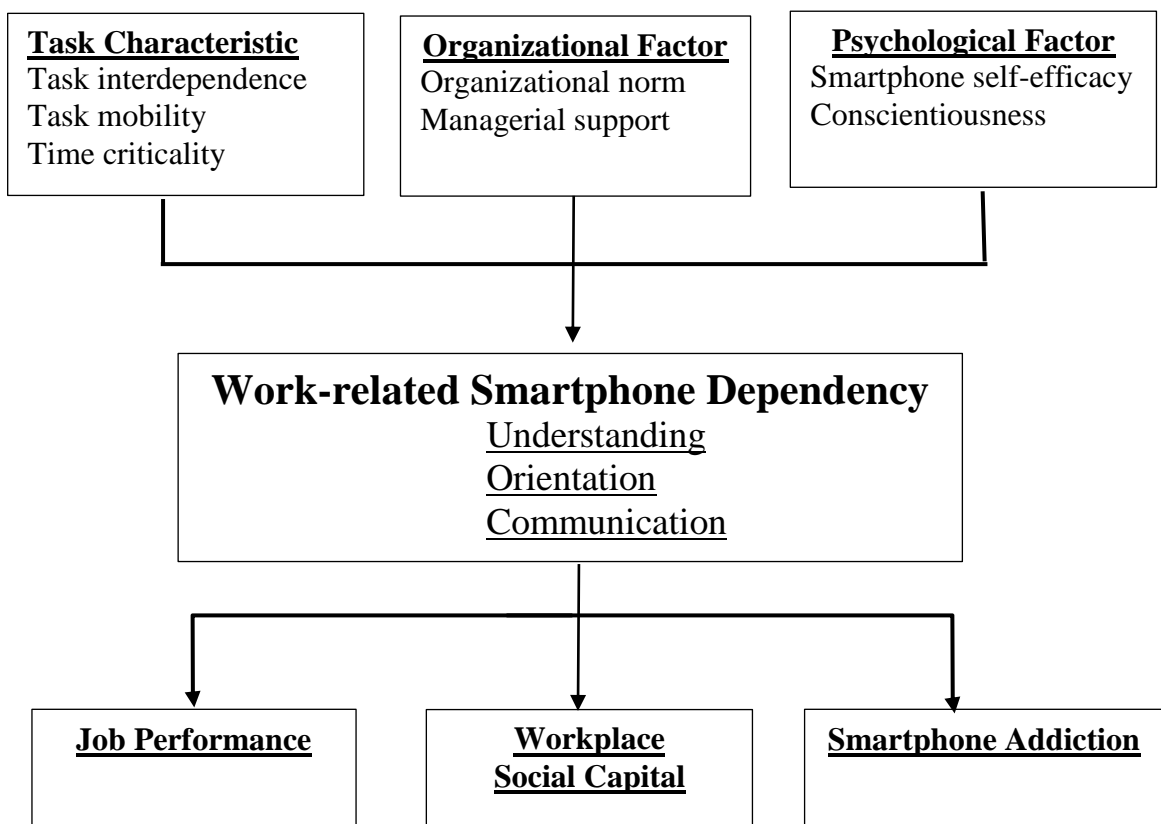


Figure 1. Research Model

CHAPTER FIVE

OBJECTIVES AND METHODS (STUDY TWO)

Based on the existing literature and results of Study 1, I have developed a research model (see Figure 1) to explain the antecedents and consequences of work-related smartphone dependency relations of young Chinese workers. The central purpose of Study 2 is to obtain a general understanding about the level of Chinese workers' smartphone dependency at work and statistically examine the relationships proposed in this model. Chapter 5 will describe the specific research objectives and related research questions of Study 2, and then provide details on the research design and employed method.

5.1 Objectives, Research Questions, and Hypotheses

The main purpose of Study 2 is to quantitatively examine the nature of the work-related smartphone dependency and test the associations proposed in the research model. Specifically, the following three core objectives were achieved from this study.

5.1.1 Overall Intensity of Work-related Smartphone Dependency and Intensity of Specific Dependency Relation

The first objective of Study 2 was descriptive: to examine the nature of work-related smartphone dependency. In particular, the overall intensity of work-related smartphone dependency and the intensity of each specific dependency relation (i.e., understanding, communication and orientation) were examined. Thus, the following two research questions were proposed:

RQ1a: What is the degree of the overall intensity of work-related smartphone dependency among young working adults in China?

RQ1b: What is the degree of the intensity of each specific dependency relation (i.e., understanding, orientation and communication) young Chinese working adults developed with their smartphones at work?

5.1.2 Antecedents of Overall Work-related Smartphone Dependency and Each Specific Dependency Relation

The second objective of Study 2 was to examine the antecedents of overall work-related smartphone dependency and each specific dependency relation. Specifically, this study examined how task characteristics (i.e., task interdependence, task mobility, and time criticality), organizational factors (i.e., organizational norm managerial support), and personal psychological factors (i.e., smartphone self-efficacy and conscientiousness) predicted overall intensity of work-related smartphone dependency and intensity of each specific dependency relation.

Regarding the antecedents of overall intensity of work-related smartphone dependency, the following research question RQ2a and hypotheses were posited:

RQ2a: To what extent do task characteristics (i.e., task interdependence, task mobility, and time criticality), organizational factors (i.e., organizational norm and managerial support), and psychological factors (i.e., conscientiousness and

smartphone self-efficacy) predict the overall intensity of work-related smartphone dependency of young working adults in China?

Based on the literature review in Chapter 2 and interview results of Study 1, it is expected that Chinese workers are likely to depend on their smartphones at work when they are: 1) involved with highly interdependent, mobilized, or time critical tasks, or 2) under organizational norms or managerial support for smartphone use at work, 3) or with high levels of smartphone self-efficacy or conscientiousness. Thus, the following hypotheses were proposed regarding RQ2a:

H1: Task interdependence is positively associated with the overall intensity of work-related smartphone dependency of young working adults in China.

H2: Task mobility is positively associated with the overall intensity of work-related smartphone dependency of young working adults in China.

H3: Time criticality is positively associated with the overall intensity of work-related smartphone dependency of young working adults in China.

H4: Organizational norm is positively associated with the overall intensity of work-related smartphone dependency of young working adults in China.

H5: Managerial support is positively associated with the overall intensity of work-related smartphone dependency of young working adults in China.

H6: Smartphone self-efficacy is positively associated with the overall intensity of work-related smartphone dependency of young working adults in China.

H7: Conscientiousness is positively associated with the overall intensity of work-related smartphone dependency of young working adults in China.

Study 1 suggests that task characteristics (i.e., task interdependence, task mobility, and time criticality), organizational factors (i.e., organizational norm and managerial support), and psychological factors (i.e., conscientiousness and smartphone self-efficacy) seems to trigger different levels of smartphone dependency relations at work. However, due to the dearth of research on the associations between these antecedent factors and three specific dependency relations, I proposed the following research questions (RQ2b, RQ2c, and RQ2d) regarding the antecedents of three work-related smartphone dependency relations:

RQ2b: To what extent do task characteristics (i.e., task interdependence, task mobility, and time criticality), organizational factors (i.e., organizational norm and managerial support), and psychological factors (i.e., conscientiousness and smartphone self-efficacy) predict the intensity of understanding smartphone dependency relation of young working adults in China?

RQ2c: To what extent do task characteristics (i.e., task interdependence, task mobility, and time criticality), organizational factors (i.e., organizational norm and managerial support), and psychological factors (i.e., conscientiousness and smartphone self-efficacy) predict the intensity of orientation smartphone dependency relation of young working adults in China?

RQ2d: To what extent do task characteristics (i.e., task interdependence, task mobility, and time criticality), organizational factors (i.e., organizational norm and managerial support), and psychological factors (i.e., conscientiousness and

smartphone self-efficacy) predict the intensity of communication smartphone dependency relation of young working adults in China?

5.1.3 Consequences of Overall Work-related Smartphone Dependency and Each Specific Dependency Relation

The third objective of this study was to examine the extent to which their overall intensity of work-related smartphone dependency and the intensity of each specific dependency relation influence their job performance, workplace social capital and smartphone addiction.

Regarding the impacts of overall intensity of work-related smartphone dependency on job performance, workplace social capital, and smartphone addiction, the following research question (RQ3a) was proposed:

RQ3a: To what extent are young Chinese working adults' job performance, workplace social capital, and smartphone addiction affected by the overall intensity of work-related smartphone dependency?

Based on the discussions in Chapter 2 and interview results of Study 1, it is expected that the more young Chinese employees depended on their smartphones at work, the better job performance and stronger workplace social capital they would had.

However, at the same time, the higher level of smartphone addiction symptoms they would experience. Thus, the following hypotheses were posited regarding RQ3a:

H8: The overall intensity of work-related smartphone dependency is positively associated with the job performance of young Chinese working adults.

H9: The overall intensity of work-related smartphone dependency is positively associated with the workplace social capital of young Chinese working adults.

H10: The overall intensity of work-related smartphone dependency is positively associated with the level of smartphone addiction symptoms of young Chinese working adults.

Study 1 also suggests different dependency relations seems to trigger different outcomes. However, due to the dearth of research on the associations between three dependency relations and job performance, between three dependency relations and workplace social capital, and between three dependency relations and smartphone addition, I proposed the following research questions (RQ3b, RQ3c, and RQ3d) regarding the outcomes of three work-related smartphone dependency relations:

RQ3b: To what extent is young Chinese working adults' job performance affected by the intensity of each specific dependency relation (understanding, orientation, and communication)?

RQ3c: To what extent is young Chinese working adults' workplace social capital affected by the intensity of each specific dependency relation (understanding, orientation, and communication)?

RQ3d: To what extent is young Chinese working adults' smartphone addiction affected by the intensity of each specific dependency relation (understanding, orientation, and communication)?

5.2 Method

5.2.1 Research Design

A quantitative approach was utilized to answer the research questions of Study 2. The quantitative approach is valuable in being used here because it can provide a statistical representation of how and why people were dependent on their smartphones at work, and to what extents such dependency was associated with their job performance, workplace social capital and smartphone addiction. Online survey was used as the data collection method for this study. The rationale for using an online survey is two-fold. On the one hand, online survey is a low-cost and quick method to collect data from respondents as compared with other survey methods such as the paper-and-pencil method and telephone interviews. On the other hand, online survey can improve the response rates as it is highly convenient for the respondents given that they are able to answer the questionnaire in their own pace, preferred time, and preferences. Thus, an online survey was selected for data collection in study 2.

5.2.2 Population and Sampling Frame

The purposive and snowballing sampling technique was used to recruit the participants. Similar to Study 1, the inclusion criteria for recruiting the survey participants are (1) full-time workers in mainland China; (2) aged from 18 to 35; and (3) using or have used smartphone for work-related purposes. I used purposive sampling for three reasons. First, this study was limited to those participants who meet the above criteria. Second, previous empirical research has successfully used purposive sampling to examine media uses and dependency (Perse, 1992; Sun, 2004). Third, the most important objective of current study was to clarify the relationships among concepts instead of generalizing to the whole population (Perse, 1992). The

reason for accompanying with the snowballing sampling technique was to increase the sample size. Biernacki and Waldorf (1981) suggested that snowballing sampling method is especially useful for recruiting the research subjects who were hard to research. As a doctoral student in Singapore, it is difficult for me to reach a large sample of young workers in mainland China without employing the snowballing sampling technique. Thus, I utilized purposive and snowballing sampling techniques together in recruiting the participants for study 2. The detailed recruiting procedure is described in the following data collection section.

In total, 665 people filled the survey. After data cleaning, the survey yielded 527 valid respondents. According to a priori power analysis using G-Power software (Faul, Erdfelder, Lang, & Buchner, 2007), the study requires at least 311 participants to ensure that the study can identify effects as minute as 0.02, while ensuring that a power of 0.80 is maintained within a 95% confidence interval in regression analysis. The total sample of Study 2 (n=527) meets the required statistical power for the study. Thus, although the non-random sampling techniques used in this study are likely to weaken the generalizability of the research results, my sample has enough statistical power to test the theoretical links between variables.

5.2.3 Data Collection

Based on the existing literature and interview results, a preliminary questionnaire was developed for the study. Since it is an online survey, I made efforts to keep the instrument short, user-friendly, easy to administer, and easy to understand. The whole survey consisted of around 84 questions in five sections (general smartphone usage information, work-related smartphone dependency relations, antecedents, outcomes and demographics) (see Appendix F). Because this study

targeted at Chinese working adults and Chinese is the official language used in Mainland China, the survey questions were translated into simplified Chinese (see Appendix G). After I finished the translation, the Chinese version of survey questions was double-checked by three Chinese-educated graduate students in Nanyang Technological University in terms of the accuracy of the translation. Approximately, the questionnaire took 20–30 minutes for the respondents to complete.

Before actual online data collection commences, a pretest was conducted to verify whether the questionnaire is suitable and could be understood as intended, and test actual online survey administration. A convenience sample of 15 working adults were recruited to fill the survey and to provide comments on problems in the comprehension of items and instructions, and also time spent in conducting the survey. Their answers were taken into considerations when producing the final copy of the questionnaire. After minor adjustments were made to the online questionnaire based on pre-test results, the final questionnaire was posted to the VERINT survey system provided by Nanyang Technological University from December 29, 2015 to January 20, 2016. An invitation WeChat message with a URL survey link (<http://survey.ntu.edu.sg/efm/se.ashx?s=705E3ED97E06A708>) was sent to the potential participants who met the above selection criteria through my personal networks. Within the WeChat message, the purpose and nature of this survey, eligibility requirements for participants, time required to complete the survey, my academic affiliations as well as contact information were also explained. Notably, in order to obtain diverse data, the survey was initially and intentionally disseminated to employees who are working in different organizations at the Beijing, Sichuan, and Yunnan. These three locations represent major economic zones in mainland China, with Beijing being the first-tier district, while Sichuan and Yunnan belong to the

second- and third-tier districts respectively. Then, participants were asked to forward this message to their coworkers and friends who are qualified for this study to take the survey. Notably, although I intentionally disseminated the survey to the potential participants working at the Beijing, Sichuan, and Yunnan via my personal network at the first stage, after a few rounds of snowballing recruitment processes, some employees working in other urban cities were also recruited. Chapter 6 will describe the participants' profile in detail.

5.2.4 Ethical Consideration

To protect participants from no harm, their participation was completely voluntary and informed consent was obtained online before starting the survey (see Appendix H for the English version of consent form; see Appendix I for the Chinese version of consent form). They were also informed that they could quit the survey at any time, and their responses were kept confidential and solely used for academic or publication purposes. To ensure that participants' anonymity and confidentiality are protected, they were assured that personal information would be kept confidentially, and any element that might reveal their identities were removed or expressed in the course of data reporting. Participants with full valid responses were given \$SGD 6 via WeChat "Electronic Red Envelop" application as a token of appreciation. Notably, before starting the survey, approval was obtained from Institutional Review Board (IRB) of Nanyang Technological University (*Reference No.: IRB-2015-10-004*, see Appendix J).

5.2.5 Variables and Their Measures

This section describes the measurements of the key variables in this study. In general, the survey items were derived from an extensive review of literature. Based on the results from the Study 1, they were modified to fit the context of this study. Below is the description of the items that were used to measure each of the variables. (Note. Scale evaluation is reported in the next section 5.2.6)

Work-related Smartphone Dependency. Following majority of media dependency studies (e.g., Ball-Rokeach, 1985; DeFleur & Ball-Rokeach, 1975; Grant et al., 1991; Lowrey, 2004; Morton & Duck, 2000; Ognyanova & Ball-Rokeach, 2015; Patwardhan & Yang, 2003; Ruiz Mafé & Sanz Blas, 2006; Sun et al., 2008), work-related smartphone dependency is operationalized as the perceived helpfulness of smartphone by the individual in meeting his/her work-related goals. The Internet dependency instrument developed by Sun, Rubin, and Haridakis (2008), which was originally constructed by Ball-Rokeach, Rokeach, and Grube (1984), was partially adapted as a departure point. Based on the results from Study 1, the measurement items of Sun et al. (2008) were modified to fit the context of current study. Finally, 10-item measure of work-related smartphone dependency was constructed. Response ranged from 1 (not at all helpful) to 5 (extremely helpful). Higher score indicating a greater level of work-related smartphone dependency of an individual. The mean score of the responses to the 10 items created the index of overall intensity of work-related smartphone dependency.

Specifically, results from a confirmatory factor analysis using Mplus software supported a three-factor scale. The first factor was “understanding dependency” (item 1-3), referring to the relation that individuals depend on smartphones to understand work-related matters ($M=3.73$, $SD=.88$). Sample items of understanding dependency

were: “in your work, how helpful is the smartphone to stay on top of what is happening at work?” and “in your work, how helpful is the smartphone to keep up with work-related events?” The second factor was “orientation dependency” (item 4-7), which represents the relation that people depend on smartphones to take effective work-related actions ($M=3.59$, $SD=.84$). Sample items of orientation dependency were: “In your work, how helpful is the smartphone to edit work-related files?” and “in your work, how helpful is the smartphone to record work-related information?” The last factor was “communication dependency”, representing that individuals depend on smartphones to communicate and interact with others for work purposes ($M=3.90$, $SD=.82$). Sample items of communication dependency were: “in your work, how helpful is the smartphone to maintain contacts with the people you work with?” and “in your work, how helpful is the smartphone to discuss work-related matters with others?” Table 3 shows the list of items including their factor loadings.

Table 3. Factor Analysis on Work-related Smartphone Dependency Relations

In your work, how helpful is the smartphone to	<i>Factors</i>			<i>Mean</i>	<i>SD</i>
	<i>1</i>	<i>2</i>	<i>3</i>		
<i>Understanding</i>					
1. stay on top of what is happening at work.	.72			3.74	.98
2. find out work-related matters.	.81			3.74	.97
3. keep up with work-related events.	.73			3.70	1.00
<i>Orientation</i>					
4. document work-related materials.		.60		3.76	1.02
5. edit work-related files.		.57		3.06	1.13
6. record work-related information.		.83		3.62	1.08
7. guide work-related activities.		.62		3.94	1.08
<i>Communication</i>					
8. discuss work-related matters with others.			.70	3.74	.94
9. maintain contacts with the people you work with.			.64	3.98	.93
10. interact with your colleagues, clients/customers for work.			.77	3.97	.91

Notes. Scale used: 1= not at all helpful and 5=extremely helpful. N=527. The cut-off value for assessing the practical significance of factor loading is .40 (Stevens, 1992).

Task Interdependence. Task interdependence was evaluated by using five items adapted from Sharma and Yetton’s (2007) scale. Respondents were asked to assess the extent to which they agree with the following statements by providing ratings based on a 5-point Likert scale that ranges from “strongly disagree” to “strongly agree.” Example items include “My task can be performed fairly independently of others” and “My task requires frequent coordination with the effort of others”. To determine the overall index of task interdependence (M=3.37, SD=.72, Cronbach’s α =.75), ratings on six items was summed and averaged.

Task Mobility. Task mobility was measured by utilizing an adapted version of Chung, Lee and Choi’s (2015) scale. The scale contains five Likert-type items with five point responses (1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 =

strongly agree). Examples of these items are “I have to move frequently to my job.” and “I often required to processing work task when I am out of office”. All the items were averaged to generate a composite index for task mobility ($M=2.34$, $SD=0.97$).

Time Criticality. To measure time criticality, this study adapted four items from Gebauer, Shaw and Gribbins (2010). Respondents were asked to rate these items on a 5-point Likert scale (1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). Sample items include “My work often requires to react towards changes promptly.” and “My work often required to deal with emergency cases”. The composite index of time criticality ($M=3.76$, $SD=.72$) was calculated by averaging the score of all items.

Organizational Norm. Organizational norm was measured by four items on a 5-point Likert scale (1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). All items were primarily adapted from a study by Stephens and Davis (2009) and then adjusted based on the results of Study 1. Sample items include “In my organization, it is normal for people to use smartphones at work.” and “In my organizations, I often see others using smartphones at work.” The composite index of organizational norm ($M=3.68$, $SD=.78$) was calculated by averaging the score of all items.

Managerial Support. Two items adapting from a scale created by Liberman, Seidman, McKenna, and Buffardi (2011) were used to measure whether employee’s upper management support smartphone use at work. Participants were asked to indicate their level of agreement with the following two items: “I am convinced that management is sure of the benefits that can be achieved with the smartphone”, on a 5-point Likert scale (1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 =

strongly agree). Ratings on two items were averaged to generate a composite index for managerial support ($M=3.63$, $SD=0.83$).

Smartphone self-efficacy. Smartphone self-efficacy was measured by three statements on a 5-point Likert scale (1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). All of the statements were adapted from a study by Bright, Kleiser, and Grau (2015). Sample items are “I find it is easy to get smartphone to do what I want to do.” and “Interacting with smartphone does not require me a lot of mental effort”. The composite index of smartphone self-efficacy ($M=3.91$, $SD=.64$) was created by averaging the all items.

Conscientiousness. Conscientiousness was measured by five items from a study by Benet-Martinez and John (1998). These items were rated on a 5-point Likert scale (1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). Example items include “I see myself as someone who is reliable” and “I see myself as someone who is self-disciplined.” To determine the overall index of conscientiousness ($M=3.96$, $SD=.59$), ratings on five items were averaged.

Job Performance. Job performance was measured using a six-item self-rating scale developed by Rodwell, Kienzle, and Shadur (1998). Participants were asked to rate their agreement with these items on a 5-point Likert scale (1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). Sample items include “I am currently working at my best performance level” and “I am one of the best at the work I do”. The composite index of job performance ($M=3.61$, $SD=.56$) was calculated by averaging 9 items. Notably, granting that self-reported measures of performance have been argumentative in other related works suggesting that such measures are exaggerated, such argument was countered by meta-analytic research (Churchill, Ford, Hartley, & Walker, 1985). Thus, self-ratings should be an appropriate measuring

approach especially when the focus here is from the employee's perspective (Bommer, Johnson, Rich, Podsakoff, & MacKenzie, 1995).

Workplace Social Capital. Workplace social capital was assessed with a validated 10-item measure (Chung, Cooke, Fry, & Hung, 2015). Using a 5-point Likert-scale (1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree), the participants were asked to rate their workplace social capital. Sample items were "I have a very good relationship with my organizational colleagues." and "My organizational colleagues think that I am a reliable partner." The score of all items were averaged to create the scale of workplace social capital (M=3.58, SD=.49).

Smartphone Addiction. Based on the results of Study 1 and the instruments developed by Bian and Leung (2015) and Li and Lin (2016), smartphone addiction was measured by 11 items in a five-point Likert scale (1 = not at all, 2 = rarely, 3 = occasionally, 4 =often, and 5 = always). Sample items include "You feel anxious if you have not checked for messages or switched on your smartphone for some time" and "When smartphone out of range for some time, you become preoccupied with the thought of missing a call". The composite index of smartphone addiction (M=3.34, SD=.75) was calculated by averaging the score of all items.

Control Variables. Although demographic variables were not included in the research model for the sake of keeping the model parsimonious, studies suggest that demographics such as gender, educational level, and income are also associated with media dependency relations (e.g., Hirschburg et al., 1986; Loges, 1994; Lowery, 2004; Patwardhan & Yang, 2003). Thus, I suspected demographic variables including gender (1=male and 2=female; 54.5% female), age (M=27.01, SD=3.41), educational level (1=Below Bachelor's degree, 2=Bachelor's degree, 3=Master's degree, 4=Doctoral degree; M=2.20, SD=0.79), marital status (1=unmarried and 2=married; 67.4%

unmarried), monthly salary (1=Below \$2,000 [include 2000], 2=\$2,000-\$4,000 [include 4000], 3=\$4,000-\$6000 [include 6000], 4=\$6,000-\$8000 [include 8000], 5=\$8,000-\$10000 [include 10000], 6=\$10,000 and above; M=3.13, SD=1.44), levels of job position (recoded: 1= junior staff workers; 2=senior staff workers and lower-level managers; 3=middle-level managers and senior-level managers; M=1.63, SD=0.60), organizational size (M=2.84, SD=1.26), work experience (1=below 2 years” to “6=Over 10 years [include 10 years]; M=2.50, SD=1.57), and smartphone experience (1=Less than 1 year [include 1 year] to 5= More than 7 years; M=3.35, SD=0.97), might influence the results of current study. To determine if these variables should necessarily be controlled in data analysis, Pearson correlations were calculated between these demographic variables and the variables in the proposed model. The two-tailed Pearson correlations (see Table 4) shows that these demographic variables correlated with other variables of interest in the model. Thus, they were treated as controlled variables in the regression analyses.

The items for measuring all the above independent variables are presented in Table 5.

Table 4. Pearson Correlations of Control Variables with Other Variables in the Model

Correlates	Gender	Age	Education	Marital status	Monthly salary	Job position	Organization size	Work experience	Smartphone experience
Task interdependence	.09*	-.01	.09*	-.04	.14**	.02	.08	-.01	.10*
Task mobility	-.18***	-.02	-.17***	-.08	.04	.11*	-.17***	-.02	-.02
Time criticality	-.09*	-.03	.05	.00	.05	.04	.12**	.03	-.03
Organizational norm	-.04	.00	-.04	.03	.18***	.15***	.01	.02	.05
Managerial support	-.11*	.12**	.07	.05	.24***	.12**	.05	.06	.09*
Smartphone self-efficacy	-.01	-.01	.09*	-.01	.14***	.05	.08	-.05	.11*
Conscientiousness	.02	.09*	.03	.05	.13**	.08	.14**	.11*	.02
Overall dependency	.00	-.03	.02	.00	.11*	.05	.01	-.02	.04
Understanding dependency	.01	-.04	.03	.01	.08	.04	.04	-.04	.04
Orientation dependency	-.01	-.04	-.02	-.03	.05	.02	-.03	-.01	-.02
Communication dependency	.01	-.01	.04	.03	.15***	.07	.01	.11	.09*
Job performance	-.12**	.11*	-.01	.05	.15***	.18***	.03	.14***	.07
Workplace social capital	-.00	.05	.08	.12**	.19***	.04	.12**	.04	.09*
Smartphone addiction	.05	.02	-.03	.01	.08	.04	-.05	.07	.14**

Notes. *p < .05, **p < .01, ***p < .001 (two-tailed). N = 527.

Table 5. Items for Measuring all Independent Variables

Items	Mean	SD
<i>Task Interdependence</i>		
1. My task can be performed fairly independently of others.	3.01	1.12
2. My task can be planned with little need to coordinate with others.	3.58	1.01
3. It is rarely required to obtain information from others to complete my task.	3.41	1.01
4. My task is relatively unaffected by the performance of other individuals or departments.	3.11	1.05
5. My task requires frequent coordination with the effort of others.	3.75	.94
<i>Task Mobility</i>		
1. I spend more time outside of company than office.	2.59	1.26
2. My job is uninhibited for space.	2.38	1.16
3. I have to move frequently to my job.	2.34	1.15
4. I work at various locations.	2.20	1.10
5. I have the freedom of choosing a place to perform my work.	2.19	1.14
<i>Time Criticality</i>		
1. My work task requires to be performed promptly.	3.63	.92
2. My work often requires to react towards changes promptly.	3.87	.82
3. My work often required to deal with emergency cases.	3.71	.92
4. Time is extremely important for my work task.	3.85	.83
<i>Organizational Norm</i>		
1. In my organization, it is normal for people to use smartphones at work.	3.61	.99
2. In my organizations, I often see others using smartphones at work.	3.56	.99
3. In my organization, everyone avoids using smartphone at work.	3.52	.97
4. In my organizations, using smartphones for day to day working practice is a popular trend.	4.02	.87
<i>Managerial Support</i>		
1. I am convinced that management is sure of the benefits that can be achieved with the smartphone	3.79	.87
2. I am always supported and encouraged by my boss to use the smartphones in my job.	3.46	.98
<i>Smartphone Self-efficacy</i>		
1. Interacting with smartphone does not require me a lot of mental effort.	3.73	.85
2. I find smartphone is easy to use.	4.05	.77
3. I find it is easy to get smartphone to do what I want to do.	3.95	.76
<i>Conscientiousness</i>		
1. I see myself as someone who is reliable.	4.21	.72
2. I see myself as someone who perseveres until the task is finished.	3.90	.78

3. I see myself as someone who is responsible for the job.	4.20	.68
4. I see myself as someone who does a thorough job.	3.76	.79
5. I see myself as someone who is self-disciplined.	3.73	.81

Job Performance

1. I am currently working at my best performance level.	3.18	.88
2. I try to be at work as often as I can.	4.00	.70
3. I am one of the best at the work I do.	3.53	.83
4. I set very high standards for my work.	3.62	.80
5. My work is always of high quality.	3.66	.73
6. I am proud of my work performance.	3.68	.80

Workplace Social Capital

1. I am not very close to my organizational colleagues	3.69	.94
2. I have a very good relationship with my organizational colleagues.	3.76	.80
3. I do not spend a lot of time interacting with employees in the organization.	3.33	.99
4. I don't trust that my organizational colleagues are worthy to rely on	3.35	.99
5. I know my organizational members will try to help me when I get into difficulties.	3.69	.72
6. My organizational colleagues think that I am a reliable partner.	3.82	.66
7. There is considerable consensus among my organizational colleagues about what is important at work.	3.73	.75
8. My organizational colleagues are not enthusiastic about achieving goals and missions of the organization	3.28	.96
9. My organizational colleagues and I always share the same ambitions and goals at work.	3.53	.77

Smartphone Addiction

1. You find it difficult to switch off your Smartphone.	3.27	1.14
2. You feel anxious if you have not checked for messages or switched on your Smartphone for some time.	3.18	1.13
3. You feel panic or unsettling if you forgot to bring the phone.	3.57	1.10
4. You feel anxious if your Smartphone were out of battery.	3.71	1.05
5. When Smartphone out of range for some time, you become preoccupied with the thought of missing a call.	3.30	1.11
6. When you are unable to use Smartphone, you miss it so much.	3.63	1.07
7. You check the Smartphone status very frequently throughout the daily activities.	3.78	.98
8. You have been told that you spend too much time on your Smartphone.	3.95	1.08
9. You find yourself engaged on the Smartphone for longer period of time than intended.	3.37	1.07
10. Your friends and family complain about your Smartphone use.	2.81	1.13
11. You can never spend enough time on your Smartphone when you use it.	3.01	1.14

Notes. N=527

5.2.6 Scale Evaluation

To assess the reliability and validity of the multiple-item continuous composite measures, several tests were conducted. First, convergent validity test was performed to check how well subscales correlate with other measures that are assumed to be related (Meirte et al., 2016). Table 6 shows that all multi-item scales have adequate internal consistency and convergent validity since they satisfy the recommended values for Cronbach's alpha (≥ 0.70) (DeVellis, 1991), Composite Reliability (≥ 0.70) (Lin, Paragas, & Bautista, 2016), and Average Variance Extracted (≥ 0.50) (Fornell & Larcker, 1981).

Table 6. Convergent Validity of Constructs and Collinearity Results

Scale	Mean	SD	AVE	CR	α	Collinearity	
						Tolerance	VIF
Task Interdependency	3.37	.72	.71	.88	.75	.89	1.13
Task Mobility	2.34	.97	.67	.91	.89	.83	1.21
Time Criticality	3.76	.72	.68	.90	.84	.87	1.15
Organizational Norm	3.68	.78	.66	.89	.83	.65	1.54
Managerial Support	3.63	.83	.80	.89	.75	.68	1.48
Smartphone Self-efficacy	3.91	.64	.64	.84	.74	.83	1.21
Conscientiousness	3.96	.59	.61	.89	.84	.81	1.23
Understanding Dependency	3.73	.88	.80	.92	.87	.50	2.01
Orientation Dependency	3.59	.84	.60	.86	.78	.66	1.52
Communication Dependency	3.90	.82	.78	.91	.86	.46	2.17
Job Performance	3.61	.56	.50	.85	.79	N.A.	N.A.
Workplace Social Capital	3.58	.49	.55	.86	.74	N.A.	N.A.
Smartphone Addiction	3.34	.75	.51	.90	.89	N.A.	N.A.

Note. SD = Standard Deviation; AVE = Average Variance Extracted; CR= Composite Reliability; α =Cronbach's Alpha; VIF=Variance Inflation Factors; N.A.= Not Applicable. Values for AVE, Composite Reliability, and Cronbach's alpha were generated by using Smart PLS software version 2.0.M3. Collinearity statistics were computed via SPSS software.

Second, discriminant validity test was conducted for examining if the constructs discriminate between groups with known differences (Tyack, Simons, Spinks, & Wasiak, 2012). Table 7 demonstrated that all scales have good discriminant validity as the square root of AVE for each construct is greater than the correlations between all pairs of constructs (Fornell & Larcker, 1981).

Table 7. Correlations and Discriminant Validity of Constructs

<i>Sale</i>	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Interdependence	.84												
2 Mobility	.30	.82											
3 Time criticality	.06	.11	.82										
4 Norm	-.08	.28	.27	.81									
5 Support	-.01	.20	.21	.54	.89								
6 Self-efficacy	.04	.00	.18	.24	.25	.80							
7 Conscientious	.11	.11	.22	.49	.39	.28	.78						
8 Performance	-.16	.07	.29	.17	.19	.20	.41	.71					
9 Social capital	.04	.00	.18	.15	.16	.20	.31	.52	.74				
10 Addiction	-.05	.07	.03	.17	.18	.09	.06	.11	.10	.71			
11 Understanding	.10	.10	.25	.47	.40	.24	.22	.13	.18	.27	.89		
12 Orientation	-.05	.14	.13	.39	.30	.25	.22	.20	.22	.27	.51	.77	
13 Communication	.11	.11	.22	.49	.39	.28	.22	.17	.23	.23	.59	.56	.88

Note. Diagonal elements are results of the square root of AVE and should exceed the inter-construct correlations to establish discriminant validity. Interdependence= Task interdependence; Mobility= Task mobility; Norm= Organizational Norm; Support= Managerial support; Self-efficacy= Smartphone self-efficacy; Conscientious =Conscientiousness; Performance= Job performance; Social capital= Workplace social capital; Addiction= Smartphone addiction; Understanding= Understanding dependency; Orientation= Orientation dependency; Communication= Communication dependency.

Last, all independent variables were also assessed for potential multicollinearity, which may cause large standard errors (Williams, 2015). The results from Table 6 shows that the value of Variance Inflation Factors (VIF) do not reach the critical value

of 4 while the Tolerance values exceeds 0.200 (Lin, Paragas, & Bautista, 2016), suggesting that the all independent variables in my research have no multicollinearity problem. Besides, the correlation coefficients among all independent variables were less than .07 (see Table 7), further indicating that the constructs do not exhibit severe multicollinearity problems.

5.2.7 Analytical Approach

Responses of online survey were downloaded into a SPSS format for statistical analysis. One of the major benefits of using this interactive format is that response values can be specified at the programming stage itself, hence eliminating the need for data entry. At the same time, it also eliminates operator error, requires less data cleaning before statistical analysis, and decreases nonsystematic error. In total, 665 people filled the survey. A careful screening of the returned responses was conducted to identify problematic response set and incomplete surveys. Those with problematic responses (e.g., consistently giving the same weight to all answers and consistently give the regular items and reverse items the same answer weights) and incomplete responses were removed from the final analysis. After data screening and cleaning, the survey yielded 527 valid respondents.

SPSS 21 (IBM predictive analytics software) was the main software used to analyze the data. Data analysis proceeded in several steps. First, frequency tests were used to generate descriptive data about the sample demographic profile and their general smartphone usage patterns. Second, I computed mean scores for the overall intensity of work-related smartphone dependency and each specific dependency relation. Then, to answer research questions about the antecedents and consequences of overall intensity of work-related smartphone dependency and intensity of each

specific dependency relation, hierarchical regression analysis was employed. The reason for choosing hierarchical regression analysis is two-folded: 1) Hierarchical regression could provide the most straightforward way to examine the relationships between potential independent variables and an outcome variable by fitting a linear equation to the observed data; 2) it could assess the unique variance in the dependent variable that is attributed to each block of variables (Cohen et al., 2003). The assumed hierarchical order of the independent variables used in this study was based on research framework. In short, the selection of the analyzing techniques is mainly based on criteria that choosing the one which can best answer my research questions.

In sum, this Chapter described the research objectives of Study 2 and the research process that was commenced. The sampling and recruitment, and data collection and analysis procedures to which this study has adhere has been carefully documented. The next chapter will present the findings of this survey study.

CHAPTER SIX RESULTS (STUDY TWO)

The central purpose of Study 2 is to quantitatively examine the nature of the work-related smartphone dependency and test the associations proposed in the research model. Analyzing the survey data from 527 young working adults in China, the results of Study 2 will be reported in this Chapter. At first, descriptive results on respondent profile will be provided. Then, results regarding each of the research questions will be reported.

6.1 Respondent Profile: Descriptive Analysis

Table 8 presents the respondents profiles. The average age of the respondents is around 27.01 years old ($M=27.01$, $SD=3.412$). Most of them are females (54.5%) and unmarried (67.4%). Respondents indicated a generally high level of education, with 57.9% of the participants obtained a bachelor's degree, 27.4% were holders of master's degree or above. The respondents worked in different professions in Mainland China, including 25.8% admin officers, 18.4% IT technicians, 13.9% teachers or researchers, 12.9% healthcare workers (i.e., doctors & nurses), 12.3% salespersons or marketing workers, 2.5% media workers and 14.2% others. Over half of them (60.9%) had the working experience of less than four years. Except for 22.6% of the respondents at the managerial-level position of their organizations, the rest of them were the junior staff workers (43.3%) and middle-level staff workers (34.2%). In terms of their monthly salary, majority of the respondents (62.2%) earned over RMB4000 (about US\$620), with 11.2% earned more than RMB10000 (about US\$1550) per month.

With respect to their working location, all of the respondents come from urban cities in mainland China, including 38.1% worked at the top-tier cities (e.g., Beijing, Shanghai, and Tianjin), 43.5% worked at the second-tier cities (e.g., Chengdu, Chongqing, and Changsha), and 20.5% worked at the third or fourth tier cities (e.g., Kunming, Guangxi and Guiyang).

Almost all respondents (98.7%) have used smartphone over one year, with 17.5% reporting 1 to 3 years of usage, 40% reporting 3 to 5 years of usage, 26.2% indicating 5 to 7 years of usage, and 14.2% reporting over 7 years of usage. However, there were still having seven respondents (1.3%) indicated that they just stated using smartphone for less one year. Regarding the brand of the smartphone they are using, nearly half of them (48.6%) were the iPhone users. The rest of smartphone brand were: Samsung (8.2%), Xiaomi (12.9%), Huawei (12%) and others (18.4%). As for smartphone functions, they used Instant Messaging apps (e.g., WeChat) (Mean=4.03, SD=1.01) most frequently, followed by web browsing (Mean=3.49, SD=1.00), voice calling (Mean=3.49, SD=0.97), email (Mean=3.11, SD=1.11), Short Message Services (Mean=2.90, SD=1.00), and mobile social media like microblogging (Mean=2.48, SD=1.26).

Although the sample cannot be considered fully representative of the young working adults in China, some demographic comparisons can be made. On average, smartphone users in China tend to be better educated and higher income groups (iiMedia Research, 2016). The respondents in current study demonstrated a similar profile. Additionally, the average age of young working adults (18-35) is 26.5, so even though our sample is somewhat skewed toward slightly older workers (27), it may not be overly unrepresentative. Besides, according to iiMedia Research (2016), the gender distribution of the smartphone users in China approaches to equal, with 52.7% male

and 47.3% of females. The sample of this study also had approximately equal number of males (240) and females (287).

Table 8. Survey Respondent Profile

	Respondents (N=527)	Percentage (%)
Age		
18-20	15	2.80
21-24	100	19.00
25-30	332	63.00
31-35	80	15.20
Gender		
Male	240	45.50
Female	287	54.50
Educational Level		
Below Bachelor's degree	78	14.80
Bachelor's degree	305	57.90
Master's degree	102	19.30
Doctoral degree	42	8.00
Marital Status		
unmarried	355	67.40
Married	172	32.60
Occupations		
Admin officers	136	25.80
IT technicians	97	18.40
Teachers & researchers	73	13.90
Healthcare workers (i.e., doctors & nurses)	68	12.90
Salespersons & marketing workers	65	12.30
Media workers	13	2.50
Others	75	14.20
Work experience		
Below 2 years	184	34.90
2-4 years (include 2 years)	137	26.00
4-6 years (include 4 years)	82	15.60
6-8 years (include 6 years)	50	9.50
8-10 years (include 8 years)	33	6.30
Over 10 years (include 10 years)	41	7.80
Job Position		
Junior staff workers	228	43.30
Senior staff worker	180	34.20
Lower-level managers	85	16.10
Middle-level managers	31	5.90
Senior-level managers	3	0.60
Monthly Salary (RMB)		
Below 2,000 (include 2000)	49	9.30

2,000-4,000(include 4000)	150	28.50
4,000-6000(include 6000)	165	31.30
6,000-8000 (include 8000)	67	12.70
8,000-10000 (include 10000)	37	7.00
10,000 and above	59	11.20
Size of Organization		
0-50 employees	123	23.30
51-100 employees	94	17.90
101-200 employees	53	10.10
201 and above employees	257	48.80
Job Location		
Tier 1 cities	191	38.10
Tier 2 cities	228	43.50
Tier 3 cities	108	20.50
Smartphone experience		
Less than 1 year (include 1 year)	7	1.30
Between 1 year to 3 years (include 3 years)	92	17.50
Between 3 years to 5 years (include 5 years)	215	40.80
Between 5 years to 7 years (include 7 years)	138	26.20
More than 7 years	75	14.20
Types of Smartphones		
iPhone	256	48.60
Samsung	43	8.20
Xiaomi	68	12.90
Huawei	63	12.00
Others	97	18.40

6.2 Results for Research Questions

This dissertation aims to examine three aspects of smartphone dependency at work: dependency relations, antecedents, and consequences. As such, the research questions of Study 2 also targeted on these three aspects. In the following sections, I will state the research questions first. Then, the analytical approach using for answering these research questions will be explained. The results will be reported in the end.

6.2.1 Overall Intensity of Work-related Smartphone Dependency and Intensity of Specific Dependency Relation

In this section, the following two research questions were addressed:

RQ1a: What is the degree of the overall intensity of work-related smartphone dependency among young working adults in China?

RQ1b: What is the degree of the intensity of each specific dependency relation (i.e., understanding, orientation and communication) young Chinese working adults developed with their smartphones at work?

RQ1a examined the overall intensity of work-related smartphone dependency, that is, the extent to which respondents found smartphone helpful to meet their various work-related goals. RQ1b examined the intensity of each specific dependency relation. That is, to what extent respondents found smartphone helpful to obtain each of three work-related goals: understanding, orientation, and communication. Mean and Standard Deviation were utilized to answer these two questions.

The results from Table 9 show that the overall intensity of work-related smartphone dependency was 3.74 (SD=.72), suggesting that respondents were approaching to strongly dependent on smartphone to obtain various work-related goals. Specifically, respondents were most dependent on smartphone for meeting communication goals at work (Mean=3.90, SD=.82), followed by for achieving understanding (Mean=3.73, SD=.88) and orientation goals (Mean=3.60, SD=.84). Thus, RQ1a and RQ1b were answered.

Table 9. Results for Overall Intensity of Work-related Smartphone Dependency and Intensity of Each Dependency Relation

	Mean	SD
Overall Dependency	3.74	.72
Understanding	3.73	.88
Orientation	3.60	.84
Communication	3.90	.82

Note. Scales ranged from 1 (not at all helpful) to 5 (extremely helpful), with higher number indicating stronger intensity.

6.2.2 Antecedents of Overall Work-related Smartphone Dependency

Regarding the antecedents of overall intensity of work-related smartphone dependency, the following research question was addressed in this section:

RQ2a: To what extent do task characteristics (i.e., task interdependence, task mobility, and time criticality), organizational factor (i.e., organizational norm and managerial support), and psychological factors (i.e., conscientiousness and smartphone self-efficacy) predict the overall intensity of work-related smartphone dependency of young working adults in China?

RQ2a examined how task characteristics (i.e., task interdependence, task mobility, and time criticality), organizational factor (i.e., organizational norm and managerial support), and psychological factors (i.e., smartphone self-efficacy and conscientiousness) affect overall intensity of work-related smartphone dependency. Based on existing literature and the results from Study 1, I proposed that: task interdependence (H1), task mobility (H2), time criticality (H3), organizational norm (H4), managerial support (H5), smartphone self-efficacy (H6), conscientiousness (H7) is positively associated with the overall intensity of work-related smartphone dependency of young working adults in China. Hierarchical regression analysis was used to answer these questions and test hypotheses. Overall intensity of work-related smartphone dependency was entered as the dependent variable. Then, controlled

variables were entered first, followed by task characteristics in the second block, organizational factors in the third block, and psychological factors in the end. Before running the multivariate analyses, a bivariate correlation analysis was run to take a cursory look at the relationships among all the variables at the zero-order level. Table 10 presents the results of the analysis.

At the zero-order level, results from the first block indicated that young workers' monthly salary ($\beta=.11$, $p<.05$) were statistically correlated with the total intensity of work-related smartphone dependency. However, this significant association was swept away when other variables were added into the regression model. Block 1 accounted for a 2.20% of the total variance in the dependent variable. Regarding the predictive power of task characteristics, results show that all three task characteristics were positively correlated with the dependent variable at the zero-order level. However, only task interdependence ($\beta=.10$, $p<.01$) remains to be significant, after other variables were subsequently entered into the regression model. Therefore, H1 was supported, but H2 and H3 were rejected. This block accounted for 6.50% of the total variance in the model. With regard to organizational factors, the beta coefficients show that both organizational norm ($\beta=.39$, $p<.001$) and managerial support ($\beta=.16$, $p<.001$) had significant association with the overall intensity of work-related smartphone dependency. Hence, H4 and H5 were supported. This is the most influential block which individually explained 23.60% of the total variance in the model. As for individual factors, the regression results show that both smartphone self-efficacy ($\beta=.09$, $p<.05$) and conscientiousness ($\beta=.10$, $p<.05$) were associated with the overall intensity of work-related smartphone, supporting H6 and H7. They accounted for a 2.00% of the total variance in the dependent variable.

To sum up, the overall model explained 34.30% of the variance in the dependent variable. Task interdependence, organizational norm, managerial support, smartphone self-efficacy, and conscientiousness were positively linked with the overall intensity of work-related smartphone dependency, thus RQ2a was answered.

Table 10. Regression Results Predicting Overall Work-related Smartphone Dependency

	<i>Zero-Order</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
<i>Block 1: Control variables</i>					
Gender	.00	.02	.05	.03	.03
Age	-.03	-.11	-.08	-.07	-.07
Educational level	.02	-.01	-.00	.03	.03
Marital status	.00	.05	.07	.02	.03
Monthly salary	.11*	.14*	-.11*	.00	-.01
Job position	.05	.05	.02	-.03	-.03
Organization size	.01	.00	-.01	-.02	-.04
Work experience	-.02	-.03	-.04	.03	.03
Smartphone experience	.04	.02	.03	.00	-.00
Incremental R^2 (%)		2.20			
<i>Block 2: Task characteristics</i>					
Task interdependence	.09*		.08	.09*	.10**
Task mobility	.11*		.12*	-.01	.02
Time criticality	.23***		.21***	.08*	.05
Incremental R^2 (%)			6.50***		
<i>Block 3: Organizational factor</i>					
Organizational norm	.53***			.41***	.39***
Managerial support	.42***			.19***	.16***
Incremental R^2 (%)				23.60***	
<i>Block 4: Psychological dispositions</i>					
Smartphone self-efficacy	.26***				.09*
Conscientiousness	.25***				.10*
Incremental R^2 (%)					2.00***
Total R^2 (%)					34.30***

Notes. $N = 527$. Cell entries for all models are final standardized regression coefficients for Blocks 1, 2, 3, and 4.

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

6.2.3 Antecedents of Understanding Dependency Relation

Regarding the antecedents of understanding dependency, the following research question was addressed in this section:

RQ2b: To what extent do task characteristics (i.e., task interdependence, task mobility, and time criticality), organizational factor (i.e., organizational norm and managerial support), and psychological factors (i.e., conscientiousness and smartphone self-efficacy) predict the intensity of understanding smartphone dependency relation of young working adults in China?

RQ2b examined the extent to which task characteristics (i.e., task interdependence, task mobility, and time criticality), organizational factor (i.e., organizational norm), and psychological factors (i.e., smartphone self-efficacy and conscientiousness) predict the intensity of understanding dependency relation. Hierarchical regression analysis was used to answer these two questions. The intensity of understanding dependency relation was entered as the dependent variable. Then, independent variables were entered in blocks: controlled variables were entered first, followed by task characteristics in the second block, organizational factors in the third block, and psychological factors in the end. In order to take a brief look at the association among all the variables at the zero-order level, a bivariate correlation analysis was conducted before running the multivariate analyses. The results of the analysis were showed in Table 11.

The same as the results of RQ2a, none of the control variables was found to be associated with the dependent variable. Only 2.00% of the total variance was explained by this Block. With regard to task characteristics, after taking the other variables into account, young workers with high task interdependence ($\beta=.13$, $p<.01$) and high time criticality ($\beta=.09$, $p<.05$) displayed higher level of understanding dependency than their counterparts. Block 2 in total accounted for 7.50% of variance

in the dependent variable. Regarding the predictive power of organizational factors, results show that organizational norm ($\beta=.34$, $p<.001$) and managerial support ($\beta=.18$, $p<.001$) was positively linked with the dependent variable. This block solely explained 18.90% of the variance in the model. As for the individual factors, smartphone self-efficacy ($\beta=.22$, $p<.001$) and conscientiousness ($\beta=.21$, $p<.001$) were positively correlated with the understanding dependency at the zero-order level. However, these significant associations swept away after other variables were subsequently entered into the regression model. This block accounted for 0.80% of the total variance in the model.

Taken together, the overall model significantly explained 29.20% of the variance in the dependent variable. Task interdependence, time criticality, organizational norm, and managerial support at various degrees positively predicted the intensity of understanding dependency relation. Thus, RQ2b was answered.

Table 11. Regression Results Predicting Understanding Dependency Relation

	<i>Zero-Order</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
<i>Block 1: Control variables</i>					
Gender	.01	.02	.04	.03	.03
Age	-.04	-.07	-.03	-.03	-.03
Educational level	.03	-.01	-.01	.01	.01
Marital status	.01	.08	.10	.06	.06
Monthly salary	.08	.09	.07	-.03	-.04
Job position	.04	.08	.05	.01	.00
Organization size	.04	.04	.02	.01	.00
Work experience	-.04	-.10	-.12	-.06	-.06
Smartphone experience	.04	.03	.03	.01	-.00
Incremental R^2 (%)		2.00			
<i>Block 2: Task characteristics</i>					
Task interdependence	.12**		.11*	.12**	.13**
Task mobility	.08		.10*	-.01	.00
Time criticality	.25***		.23***	.11**	.09*
Incremental R^2 (%)			7.50***		
<i>Block 3: Organizational factor</i>					
Organizational norm	.47***			.35***	.34***
Managerial support	.39***			.20***	.18***
Incremental R^2 (%)				18.90***	
<i>Block 4: Psychological dispositions</i>					
Smartphone self-efficacy	.22***				.05
Conscientiousness	.21***				.07
Incremental R^2 (%)					0.80*
Total R^2 (%)					29.20***

Notes. $N = 527$. Cell entries for all models are final standardized regression coefficients for Blocks 1, 2, 3, and 4.

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

6.2.4 Antecedents of Orientation Dependency Relation

Regarding the antecedents of orientation dependency relation, the following research question was addressed in this section:

RQ2c: To what extent do task characteristics (i.e., task interdependence, task mobility, and time criticality), organizational factor (i.e., organizational norm and managerial support), and psychological factors (i.e., conscientiousness and smartphone self-efficacy) predict the intensity of orientation smartphone dependency relation of young working adults in China?

RQ2c examined the extent to which task characteristics (i.e., task interdependence, task mobility, and time criticality), organizational factor (i.e., organizational norm), and psychological factors (i.e., smartphone self-efficacy and conscientiousness) predict the intensity of orientation dependency relation. Hierarchical regression analysis was used to answer the questions. The intensity of orientation dependency relation was entered as the dependent variable. Then, independent variables were entered in blocks: controlled variables were entered first, followed by task characteristics in the second block, organizational factors in the third block, and psychological factors in the end. Before running the multivariate analyses, a bivariate correlation analysis was run to examine the relationships among all the variables at the zero-order level. The results of the analysis were reported in Table 12.

As shown in Table 12, all control variables were not statistically associated with the orientation dependency relation. This block only accounted for a 1.00% of the total variance in the model. Regarding the predictive power of Block 2, although task mobility ($\beta=.12$, $p<.01$) and time criticality ($\beta=.12$, $p<.01$) was significantly associated with the dependent variable at the zero-order level, the significances were explained away by other variables which were subsequently included into the regression model. Thus, none of the task characteristics was associated with orientation dependency

relation in the final model. Block 2 explained 2.50 % of the total variance in the dependent variable. As for Block 3, organizational norm ($\beta=.30$, $p<.001$) and managerial support ($\beta=.10$, $p<.05$) was significantly and positively related to the dependent variable. This block accounted for 13.30 % of the variance in explaining orientation dependency relation. With respect to the individual factors, the regression results show that both smartphone self-efficacy ($\beta=.10$, $p<.05$) and conscientiousness ($\beta=.12$, $p<.01$) were linked to the dependent variable after taking the other variables into account. Block 4 accounted for 2.60% of the total variance in the model.

In sum, all factors explained 19.30% of the variance in the dependent variable. Organizational norm, managerial support, smartphone self-efficacy, and conscientiousness were positively associated with the intensity of orientation dependency relation. Therefore, RQ2c was answered.

Table 12. Regression Results Predicting Orientation Dependency Relation

	<i>Zero- Order</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
<i>Block 1: Control variables</i>					
Gender	-.01	-.01	.02	.01	.00
Age	-.04	-.07	-.07	-.06	-.06
Educational level	-.02	-.02	-.01	.01	.01
Marital status	-.04	-.03	-.02	-.05	-.05
Monthly salary	.05	.09	.08	-.00	-.02
Job position	.02	.00	-.01	-.05	-.06
Organization size	-.03	-.02	-.02	-.03	-.05
Work experience	-.01	.03	.04	.09	.09
Smartphone experience	-.02	-.03	-.02	-.04	-.04
Incremental R^2 (%)		1.00			
<i>Block 2: Task characteristics</i>					
Task interdependence	-.03		-.03	-.02	-.00
Task mobility	.12**		.10*	.01	.03
Time criticality	.12**		.12**	.02	-.02
Incremental R^2 (%)			2.50**		
<i>Block 3: Organizational factor</i>					
Organizational norm	.39***			.32***	.30***
Managerial support	.29***			.13**	.10*
Incremental R^2 (%)				13.30***	
<i>Block 4: Psychological dispositions</i>					
Smartphone self-efficacy	.21***				.10*
Conscientiousness	.22***				.12**
Incremental R^2 (%)					2.60***
Total R^2 (%)					19.30***

Notes. $N = 527$. Cell entries for all models are final standardized regression coefficients for Blocks 1, 2, 3, and 4.

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

6.2.5 Antecedents of Communication Dependency Relation

Regarding the antecedents of communication dependency relation, the following research question was addressed in this section:

RQ2d: To what extent do task characteristics (i.e., task interdependence, task mobility, and time criticality), organizational factor (i.e., organizational norm and managerial support), and psychological factors (i.e., conscientiousness and smartphone self-efficacy) predict the intensity of communication smartphone dependency relation of young working adults in China?

RQ2d examined the extent to which task characteristics (i.e., task interdependence, task mobility, and time criticality), organizational factor (i.e., organizational norm), and psychological factors (i.e., smartphone self-efficacy and conscientiousness) predict the intensity of communication dependency relation. Hierarchical OLS regression analysis was used to answer the questions. The intensity of communication dependency relation was entered as the dependent variable. Then, independent variables were entered in blocks: controlled variables were entered first, followed by task characteristics in the second block, organizational factors in the third block, and psychological factors in the last block. In order to obtain a cursory understanding about the relationships among all the variables at the zero-order level, a bivariate correlation analysis was conducted before running the multivariate analyses. Table 13 shows the results of the regression analysis.

At the zero-order level, young workers' monthly salary ($\beta=.15$, $p<.001$) and their years of smartphone use ($\beta=.09$, $p<.05$) were statistically correlated with the dependent variable. However, when other variables were subsequently introduced into the regression model, these significant results were explained away. Block 1 explained 3.80% of the variance in the model. Regarding to Block 2, task interdependence ($\beta=.13$, $p<.01$) and time criticality ($\beta=.22$, $p<.001$) were shown to be significantly

correlated with the communication dependency relation at the zero-order level. However, when introducing other variables into the model, only task interdependence ($\beta=.14$, $p<.01$) remains significant. As for the Block 3, organizational norm ($\beta=.37$, $p<.001$) and managerial support ($\beta=.14$, $p<.01$) were found to be significantly associated with the communication dependency relation. Block 2 and Block 3 accounted for 6.20% and 19.70% of the total variance respectively. With respect to the prediction power of individual factors, although smartphone self-efficacy ($\beta=.24$, $p<.001$) and conscientiousness ($\beta=.21$, $p<.001$) were associated with the communication dependency relation at the zero-order level, only smartphone self-efficacy ($\beta=.09$, $p<.05$) remains significant when taking other variables into account. This Block 4 accounted for 1.30% of the total variance in the model.

To summarize, all factors explained 31.00 % of the total variance in the dependent variable. Task interdependence, organizational norm, managerial support and smartphone self-efficacy were positively associated with the communication dependency relation of young working adults in China. Thus, RQ2d was addressed.

Table 13. Regression Results Predicting Communication Dependency Relation

	<i>Zero-Order</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
<i>Block 1: Control variables</i>					
Gender	.01	.03	.05	.04	.04
Age	-.01	-.13	-.10	-.09	-.09
Educational level	.04	-.01	.01	.04	.04
Marital status	.03	.08	.10	.06	.06
Monthly salary	.15***	.17**	.14**	.04	.03
Job position	.07	.04	.02	-.03	-.03
Organization size	.01	-.01	-.02	-.04	-.05
Work experience	.01	-.00	-.02	.05	.05
Smartphone experience	.09*	.06	.06	.04	.03
Incremental R^2 (%)		3.80*			
<i>Block 2: Task characteristics</i>					
Task interdependence	.13**		.12*	.13**	.14**
Task mobility	.09		.11*	-.00	.01
Time criticality	.22***		.19***	.07	.05
Incremental R^2 (%)			6.20***		
<i>Block 3: Organizational factor</i>					
Organizational norm	.49***			.39***	.37***
Managerial support	.39***			.16**	.14**
Incremental R^2 (%)				19.70***	
<i>Block 4: Psychological dispositions</i>					
Smartphone self-efficacy	.24***				.09*
Conscientiousness	.21***				.06
Incremental R^2 (%)					1.30**
Total R^2 (%)					31.00***

Notes. $N = 527$. Cell entries for all models are final standardized regression coefficients for Blocks 1, 2, 3, and 4.

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

Table 14 summarized the prediction power of all factors on the overall intensity of work-related smartphone dependency and intensity of each specific dependency relation. It shows that: 1) organizational norm and managerial support are the most influential antecedents associated with work-related smartphone dependency relations; 2) the influence of task characteristics is dissimilar on different dependency

relations. Task interdependence was correlated with understanding dependency and communication dependency, while time criticality was linked to understanding dependency. Task mobility has no association with smartphone dependency at work.

3) the influence of psychological factors is dissimilar on different dependency relations. Smartphone self-efficacy was linked to orientation dependency and communication dependency, while conscientiousness was only associated with orientation dependency.

Table 14. Summarizing Regression Results on Predicting Work-related Smartphone Dependency and Three Dependency Relations

	<i>OVERALL</i>	<i>UND</i>	<i>ORI</i>	<i>COM</i>
<i>Block 1: Control variables</i>				
Gender	.03	.03	.00	.04
Age	-.07	-.03	-.06	-.09
Educational level	.03	.01	.01	.04
Marital status	.03	.06	-.05	.06
Monthly salary	-.01	-.04	-.02	.03
Job position	-.03	.00	-.06	-.03
Organization size	-.04	.00	-.05	-.05
Work experience	.03	-.06	.09	.05
Smartphone experience	-.00	-.00	-.04	.03
Incremental R^2 (%)	2.20	2.00	1.00	3.80*
<i>Block 2: Task characteristics</i>				
Task interdependence	.10**	.13**	-.00	.14**
Task mobility	.02	.00	.03	.01
Time criticality	.05	.09*	-.02	.05
Incremental R^2 (%)	6.50***	7.50***	2.50**	6.20***
<i>Block 3: Organizational factor</i>				
Organizational norm	.39***	.34***	.30***	.37***
Managerial support	.16***	.18***	.10*	.14**
Incremental R^2 (%)	23.60***	18.90***	13.30***	19.70***
<i>Block 4: Psychological dispositions</i>				
Smartphone self-efficacy	.09*	.05	.10*	.09*
Conscientiousness	.10*	.07	.12**	.06
Incremental R^2 (%)	2.00***	0.80*	2.60***	1.30**
Total R^2 (%)	34.30***	29.20***	19.30***	31.00***

Notes. $N = 527$. Cell entries are final standardized regression coefficients for Blocks 1, 2, 3, and 4. OVERALL = overall work-related smartphone dependency. UND= understanding dependency. ORI= orientation dependency. COM= communication dependency.

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

6.2.6 Linking Overall Work-related Smartphone Dependency to Job Performance, Workplace Social Capital, and Smartphone Addiction

In this section, the following question was addressed:

RQ3a: To what extent are young Chinese working adults' job performance, workplace social capital, and smartphone addiction affected by the overall intensity of work-related smartphone dependency?

RQ3a examined how overall intensity of work-related smartphone dependency influenced job performance, workplace social capital and smartphone addiction. Based on the existing literature and results of Study 1, I proposed that the overall intensity of work-related smartphone dependency is positively associated with the job performance (H8), workplace social capital (H9), and the level of smartphone addiction symptoms of young Chinese working adults (H10). Hierarchical regression analysis was used to answer RQ3a and test these hypotheses. Independent variables were entered into two blocks: control variables in the first block, and overall intensity of work-related smartphone dependency in the second block. Job performance, workplace social capital, and smartphone addiction were entered as dependent variable at each time. Table 15 shows the results of the regression analysis. As expected, the results indicate that respondents' overall intensity of work-related smartphone dependency was significantly associated with their job performance ($\beta=.18$, $p<.001$), workplace social capital ($\beta=.17$, $p<.001$), and smartphone addiction symptoms ($\beta=.27$, $p<.001$). Thus, H8, H9, and H10 were supported, and RQ3a was resolved.

Table 15. Regression Results Linking Overall Work-related Smartphone Dependency to Job performance, Workplace Social Capital, and Smartphone Addiction

	Job performance	Workplace social capital	Smartphone addiction
<i>Block 1: Control variables</i>			
Gender	-.10*	.03	.06
Age	-.05	-.08	-.09
Educational level	.01	.02	-.02
Marital status	.04	.16**	.04
Monthly salary	.06	.16**	.08
Job position	.12*	.00	-.06
Organization size	.02	.08	-.07
Work experience	.08	-.02	.12
Smartphone experience	.02	.04	.12**
Incremental R^2 (%)	5.80***	6.20***	4.10***
<i>Block 2: Overall dependency</i>			
Overall dependency	.18***	.17***	.27***
Incremental R^2 (%)	3.20***	2.80***	6.90***
Total R^2 (%)	9.00***	9.10***	11.00***

Notes. $N = 527$. Cell entries are final standardized regression coefficients.
 $*p < .05$, $**p < .01$, $***p < .001$.

6.2.7 Linking Three Dependency Relations to Job Performance

In this section, the following research question was addressed:

RQ3b: To what extent is young Chinese working adults' job performance affected by the intensity of each specific dependency relation (understanding, orientation, and communication)?

RQ3b investigated how respondents' three dependency relations influenced their job performance. Hierarchical regression analysis was performed to answer this question. Job performance was entered as dependent variable. Independent variables were entered into two blocks: control variables in the first block, and three dependency relations in the second block. Table 16 presents the results of the regression analysis. It shows that only orientation dependency relation ($\beta = .16$, $p < .01$) was correlated with the job performance, among all three dependency relations. That is, employees' job

performance was enhanced only when they relied on their smartphones for orientation.

Understanding dependency and communication dependency had no association with job performance. Thus, RQ3b was addressed.

Table 16. Regression Results Linking Three Dependency Relations to Job Performance

	Model 1	Model 2
<i>Block 1: Control variables</i>		
Gender	-.10*	-.10*
Age	-.07	-.05
Educational level	.01	.02
Marital status	.05	.05
Monthly salary	.08	.06
Job position	.13*	.13*
Organization size	.02	.02
Work experience	.07	.07
Smartphone experience	.02	.02
Incremental R^2 (%)	5.80***	
<i>Block 2: Dependency relations</i>		
Understanding		-.01
Orientation		.16**
Communication		.07
Incremental R^2 (%)		3.90***

Notes. $N = 527$. Cell entries are final standardized regression coefficients.

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

6.2.8 Linking Three Dependency Relations to Workplace Social Capital

In this section, the following research question was addressed:

RQ3c: To what extent is young Chinese working adults' workplace social capital affected by the intensity of each specific dependency relation (understanding, orientation, and communication)?

RQ3c examined how respondents' three dependency relations influenced their workplace social capital. Hierarchical regression analysis was performed to answer

this question. Workplace social capital was entered as dependent variable.

Independent variables were entered into two blocks: control variables in the first block, and three dependency relations in the second block. Table 17 shows the results of the regression analysis. It demonstrates that only communication dependency relation ($\beta=.16$, $p<.001$) was statistically associated with workplace social capital. Understanding and orientation dependency relations had no influence on young workers' workplace social capital. Therefore, RQ3c was answered.

Table 17. Regression Results Linking Three Dependency Relations to Workplace Social Capital

	Model 1	Model 2
<i>Block 1: Control variables</i>		
Gender	.03	.03
Age	-.10	-.08
Educational level	.02	.02
Marital status	.17**	.16**
Monthly salary	.18***	.15**
Job position	.01	.01
Organization size	.08	.08
Working experience	.03	-.04
Smartphone experience	.04	.04
Incremental R^2 (%)	6.20***	
<i>Block 2: Dependency relations</i>		
Understanding		-.05
Orientation		.09
Communication		.16*
Incremental R^2 (%)		3.50***

Notes. $N = 527$. Cell entries are final standardized regression coefficients.

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

6.2.9 Linking Three Dependency Relations to Smartphone Addiction Symptoms

In this section, the following research question was addressed:

RQ3d: To what extent is young Chinese working adults' smartphone addiction affected by the intensity of each specific dependency relation (understanding, orientation, and communication)?

RQ3d examined how three dependency relations affect the level of smartphone addiction symptoms, hierarchical regression analysis was conducted. Smartphone addiction was entered as dependent variable. Independent variables were entered into two blocks: control variables in the first block, and three dependency relations in the second block. Table 18 presents the results of the regression analysis. It shows that both understanding dependency ($\beta=.17, p<.01$) and orientation dependency ($\beta=.19, p<.001$) positively related to the smartphone addiction. That is, young workers experienced higher level of smartphone addiction symptoms when they were dependent on their smartphones for achieving understanding and orientation goals at work. However, relying on smartphone for work-related communication goals had no influence on smartphone addiction. Therefore, RQ3d was addressed.

Table 18. Regression Results Linking Three Dependency Relations to Smartphone Addiction

	Model 1	Model 2
<i>Block 1: Control variables</i>		
Gender	.06	.06
Age	-.12	-.10
Educational level	-.02	-.01
Marital status	.05	.05
Monthly salary	.11*	.09
Job position	-.05	-.06
Organization size	-.07	-.08
Work experience	.12	.13
Smartphone experience	.13**	.13**
Incremental R^2 (%)	4.10**	
<i>Block 2: Dependency relations</i>		
Understanding		.17**
Orientation		.19***
Communication		-.04
Incremental R^2 (%)		8.00***

Notes. $N = 527$. Cell entries are final standardized regression coefficients.

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

Table 19 summarized the influences of three dependency relations on job performance, workplace social capital, and smartphone addiction. Taken together, orientation dependency was positively associated with job performance of young Chinese workers. Communication dependency was positively correlated with their workplace social capital. Both understanding dependency and orientation dependency were positively associated with smartphone addiction. Interestingly, no significant association was found between communication dependency and smartphones addiction.

Table 19. Summarizing Regression Results Linking Work-related Smartphone Dependency Relations to Three Outcomes

	Job performance	Workplace social capital	Smartphone addiction
<i>Block 1: Control variables</i>			
Gender	-.10*	.03	.06
Age	-.05	-.08	-.10
Educational level	.02	.02	-.01
Marital status	.05	.16**	.05
Monthly salary	.06	.15**	.09
Job position	.13*	.01	-.06
Organization size	.02	.08	-.08
Work experience	.07	-.04	.13
Smartphone experience	.02	.04	.13**
Incremental R^2 (%)	5.80***	6.20***	4.10**
 Block 2: Dependency relations			
Understanding	-.01	-.05	.17**
Orientation	.16**	.09	.19***
Communication	.07	.16*	-.04
Incremental R^2 (%)	3.90***	3.50***	8.00***

Notes. $N = 527$. Cell entries are final standardized regression coefficients.

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

In a nut shell, this Chapter presented the results of Study 2. It showed that Chinese workers developed a fairly strong dependency relationship with their smartphones at work. Different kinds of dependency relations were associated with different antecedent factors, and resulted in different consequences. Next Chapter will discuss the key findings of Study 1 and Study 2 in detail.

CHAPTER SEVEN

OVERALL DISCUSSION AND CONCLUSION

This dissertation adopted a holistic approach to study the work-related dependency relations between young Chinese workers and their smartphones, as well as the antecedents and consequences of such dependency relations. The interesting and important findings established during the course of Studies 1 and 2 will be thoroughly discussed in this chapter. Subsequently, major theoretical, conceptual, and practical contributions of this dissertation will be highlighted, and the limitations and future directions of these studies will be discussed. A concluding remark will be presented at the end of this paper.

7.1 Levels of Work-related Smartphone Dependency Relations

First off, this dissertation demonstrates that young Chinese workers developed a fairly strong dependency on their smartphones at work. This finding corresponds with several market surveys and reports, which have shown that working people become increasingly dependent on their smartphones at work (Deal, 2013; Gartner, 2014; Murphy, 2011) and provides additional evidence of such intensifying dependency. In addition, the finding suggests that depending on smartphone to achieve work-related goals is common among young Chinese workers. Compared with western countries such as the U.S., smartphones in mainland China have a relatively shorter history with a lower rate of smartphone penetration (Pew, 2016). However, it appears that Chinese users, especially younger ones, have leapfrogged the digital divide to be as dependent on their smartphones to achieve their goals at work. The likelihood of these young working adults belonging to the early adopter categories of

smartphone adoption can probably account for such dependency. However, the prevalence of smartphone dependency at work among these young Chinese employees requires further academic investigation.

For the dependency relations, understanding, orientation, and communication were found to be the primary goals of the young Chinese adults' smartphone dependency at work. To some extent, these findings corroborate those of previous studies, which have shown that smartphones can potentially satisfy various work goals, such as facilitating constant connection, promoting autonomy, allowing flexible work organization, accelerating work response, and encouraging information acquisition and sharing (e.g., Collins et al., 2015; Kossek & Lautsch, 2012; Lanaj et al., 2014; Lee et al., 2012; Perlow, 2012; Pitichat, 2013). However, the strength of work-related smartphone dependency varied for specific goals. For instance, Study 2 shows communication dependency relation as most intensive, suggesting that young Chinese employees were most dependent on their smartphones to meet communication goals, such as discussing and interacting work matters with colleagues or clients. This result is unsurprising given that most people consider communication as the fundamental function of smartphones (Chan, 2015). The intensity of understanding dependency and orientation dependency ranked second and third, respectively, indicating that the employees were somewhat less dependent on their smartphones to meet understanding goals (e.g., being updated of work event) and least dependent on them to satisfy orientation goals (e.g., performing work-related actions). However, it has to be noted that the intensity of each dependency relation can be changed with the technological advancement of smartphone. For instance, as smartphones become "smarter", more work-related actions can be easily and effectively performed on

smartphones, which would increase the intensity of orientation dependency among workers.

Moreover, these three dependency relations supported my proposition on the changes of individual-media dependency relations in the smartphone media environment. In accordance with the MSD theory (Ball-Rokeach, 1985), the relationship between individual and media is asymmetric as individuals need to depend on the media to provide information about their social environment (Ball-Rokeach, 1998). However, my studies reveal that young workers not merely depended on their smartphones to provide them with work-related information, but also relied on the smartphone platforms to communicate and disseminate information, as well as perform various activities. On one hand, these findings imply that individuals are no longer passive receivers in smartphone media environment, but become active participants as they have more control over information on smartphones and have increased choices in what, when, where, how, and how often they can access and communicate these resources. Thus, the theoretical assumptions of the MSD theory based on one-way broadcasting model of the traditional media should be modified into the two-way communication model when employing it into the smartphone environment. On the other hand, the findings imply that, individuals in the context of smartphone media were no longer just being the “audience” of media, but turned to the “user” of the media platform. They can rely on smartphones to perform numerous activities and actions, such as taking photos, writing and editing documents, recording and documenting messages. Because of the new communication mode and multi-functional platform of smartphones, it is understandable that the range and meaning of individual-media dependency relations are changed in this new media scenario. For instance, instead of restricting it to the three individual-media dependency relations

categorized by Ball-Rokeach (1985) (i.e., understanding, orientation, and play), newly emerged relations, such as information sharing and communication, should be taken into consideration in understanding new media dependency. Future studies should devote attention to these changing media dependency relations when they use MSD theory to understand new media dependency.

Furthermore, consistent with my expectation, my studies provide evidence that the original dependency relations categorized by Ball-Rokeach (1985) cannot fully apply to all situations or contexts. For instance, one of MSD key media dependency relations (Ball-Rokeach, 1985), was found to be not applicable in my studies. The reason for not observing play dependency relation might be related to the specific topic of current dissertation. As current thesis centered on examining the smartphone dependency for work reasons, it is reasonable that non-instrumental dependency relations, such as play dependency, disappear. participants' smartphone behavior is mostly instrumental. Therefore, future researches that focus on examining the media dependency in specific settings should pay special attention to those relevant dependency relations so as to ensure the research validity.

7.2 Antecedents of Work-related Smartphone Dependency

Regarding the antecedents of work-related smartphone dependency, task attributes, organizational norm, managerial supports were found to be the influential factors affecting the individual-smartphone dependency relations at work. These findings support the MSD theory, which posits that media dependency of individuals is largely determined by their social structural environment (Ball-Rokeach, 1985).

Specifically, as expected, organizational norm was found to be the most significant factor influencing all work-related smartphone dependency relations. This

suggests that when a company has a norm of using smartphone at work, its employees are likely to develop dependency relations with their smartphones. These results are consistent with prior studies that have shown that perceived coworkers' norms in people's work settings can impact their tendency to engage in certain behaviors (e.g., D'Abate 2005; Liberman et al., 2011; Lim & Teo, 2005; Martin et al., 2010; Postmes, Spears, & Lea, 1998). Theory of Interpersonal Behavior (Triandis, 1977) can provide a theoretical explanation for these findings. It is argued that the norms within referent groups serves as a pressure that increases the likelihood that the individual will behave a certain way (Moody & Siponen, 2013). Therefore, when employees perceived there is a norm of using smartphones at work within their organization, they would follow these unwritten rules to conform to the pressures of the group and thus become rely on smartphones at work. The results could also be explained by the Social Learning Theory, noting that employees look to other coworkers as potential role models in the organization and that smartphone dependency at work is learned through copying the behaviors that they see by individuals in their organizational environment (Blau, Yang, Ward-Cook, 2006). More importantly, the significant association between organizational norm and smartphone dependency relations at work indirectly lend support to a key proposition of the MSD theory arguing that individuals' media dependency relations are affected by the activities or behaviors of their social networks (Ball-Rokeach, 1985). Since organizational norm has prescribed the ways in which all members of an organization should approach their work and interact with one another, it is not surprising that organizational norm was found to significantly affect work-related smartphone dependency relations.

Managerial support is a new identified organizational factor affecting work-related smartphone dependency in study1. Findings from Study 2 also support this

association by revealing that managerial support was significantly related to all work-related smartphone dependency relations. The more employees perceive that their managers are supportive to their smartphone use at work, the more they tend to dependent on it for work reasons. These findings concur with prior studies that showing managerial support was an influential factor affect employees' intentions to use and dependent on new media technologies, such as Internet (Chang & Cheung, 2001; Pee, Woon, & Kankanhalli, 2008; Liberman et al., 2011) and smartphones (Kim, 2008). Theory of Planned Behavior could be used for explaining these results as it argues that individual's perception about the particular behavior is influenced by the judgement of significant others (Ajzen, 1991). The opinions or judgements of companies' managements are significant for most of young working people. Thus, when they perceived their managements were supportive to smartphone use at work, they would turn to dependent on their smartphones at work. Thus, for organizations preferring to intervene in their employees' smartphone dependency at work, it is important that top management take a visible stand on smartphone use at work. They may consider making a statement for encouraging the smartphone use at work or providing some pragmatic supports like reimburse phone bills or offer phone bill allowance for their use.

As expected, task characteristics were found to be associated with work-related smartphone dependency relations. Specifically, task interdependence was associated with communication dependency and understanding dependency, whereas time criticality was linked to understanding dependency. The theory of task-technology fit can shed light on these findings. It is argued that users adopt a technology based on the fit between their task requirements and technology characteristics (Goodhue & Thompson, 1995). Interdependent tasks are involved with high levels of coordination

and cooperation (Andres & Zmud, 2002; Gebauer et al., 2010; Sharma & Yetton, 2007). When the interdependence of a task is high, employees are often required for high levels of information exchange and interactions with their co-workers in order to ensure the clarity of task assignments, devise effective task performance strategies, arrive at decisions, and collect performance feedbacks (Andres & Zmud, 2002). As smartphones can best fit this task needs by providing individuals a convenient and efficient channel to stay informed about their co-workers' progress and interact/discuss with their them, it is understandable that employees with higher level of task interdependence were more likely to develop understanding and communication dependency relations with their smartphones. Similarly, time criticality denotes the importance of time in task performance, which can be viewed from to the extent that job tasks must be performed promptly (Ballard & Seibold, 2004; Yuan et al., 2010). So, for the time critical workers, the most important and basic requirement of their job is to keep themselves stay informed. Since the functions of smartphone can perfectly fit this job requirement, it is not surprising that people with time critical tasks were more likely to develop understanding dependency with their smartphones at work.

These findings also indirectly lend support to the proposition of the MSD theory, which articulates that ambiguity and threats in the social environment can affect individual media dependency relations (Ball-Rokeach, 1985). For example, previous study found that high task interdependence increased employee job uncertainty because it required the cooperation of others in accomplishing work-related tasks (Tushman & Nadler, 1978). Such job uncertainty can place employees in unpredictable or ambiguous situations. By finding that task interdependence affected understanding and communication dependency relations on smartphone, this

dissertation provides evidences to support the proposition of MSD theory which states that ambiguities in the environment can intensify media dependency of individuals. Similarly, employees often encounter urgent cases that must be handled immediately when job tasks are time critical, and these emergencies can easily place these workers in threatening environments. By showing that time criticality related to the understanding dependency with smartphone, my studies indirectly support the proposition of the MSD theory which states that the threats in the environment can strengthen individual media dependency. Thus, my results verified that the basic assertions of the MSD theory can explain the origins of the work-related smartphone dependency of individuals.

Notably, no significant connection was found between task mobility and all three work-related smartphone dependency relations in Study 2. This finding is somewhat unexpected because, intuitively, it seems that an individual with highly mobilized job tasks would need to depend on smartphones to satisfy various work-related needs. The findings of my Study 2 demonstrate another point-of-view suggesting that task mobility cannot influence individual smartphone dependency at work. One possible explanation relates to the special attribute of task mobility. When a job task is required to perform in diverse locations, it means that this job task cannot be resolved in the office through smartphones or other CMC technologies, in other words, the task should be handled face-to-face in a different location. In this respect, it is reasonable that whether a task is highly mobilized or not does not impact on the dependency relations of employees with smartphones at work. Moreover, considering some of the respondents in Study 1 stating that task mobility influences work-related smartphone dependency, the non-significant result in Study 2 may suggest that influence of task mobility on work-related smartphone dependency is indirect. Put

differently, the influence of task mobility on work-related smartphone dependency may be mediated by some other antecedent factors. Given the confirmed association of task interdependence and time critical with some work-related dependency relations, a possible aspect to consider is whether the effect of task mobility on dependency relations are mediated by task interdependence and time criticality. In this case, future studies can use a mediational analysis (Hayes, 2009) to identify whether task mobility indirectly affect dependency through task interdependence and time criticality. Besides, the null significant association between task mobility and work-related smartphone dependency could be due the specific characteristics of my sample. As shown in Chapter 5, the task characteristics of my sample tend to be highly interdependent and time critical. Since my respondents seldom involved with mobilized tasks, it is not surprising that I cannot identify a statistical association between task mobility and smartphone dependency at work. Future studies can use a different research sample to re-test this null association.

Consistent with much of past smartphone dependency research (e.g., Lin et al., 2015; Park et al., 2013), my studies found that individuals' smartphone dependency at work is also a function of their psychological dispositions. The findings also support Ball Rokeach's (1985) argument that psychological factors can form individual media dependency. Specifically, two psychological factors, namely smartphone self-efficacy and conscientiousness, were found to be associated with the work-related smartphone dependency.

Smartphone self-efficacy is a disposition that reflect one's confidence and ability of using the smartphone. My findings show that, the more people perceived themselves capable to use smartphone to perform various actions, the more they would depend on smartphones at work. This correspond to prior studies which suggested that

the self-efficacy of new media technologies (e.g., computer, Internet, and mobile phone) increased individual's actual usage and dependency on them (e.g., Bright, Kleiser, & Grau, 2015; Chen et al., 2009). The results also congruent with SCT, which posits that self-efficacy is a prominent predictor of people's behaviors because an individual can exhibit a certain behavior only if they consider themselves to be capable of performing such behavior (Bandura, 1977).

In particular, smartphone self-efficacy was found to affect specific dependency relations differently. Smartphone self-efficacy is found to be associated with the communication dependency and orientation dependency, but not with understanding dependency. The results suggest that the level of one's smartphone self-efficacy does affect their reliance on smartphone in understanding work matters. One plausible explanation is that using smartphone for receiving information and keeping informed on work issues does not require complicated skills. The demographic information in Chapter six shows that the respondents of current study tend to be better educated ones and majority of them used smartphones more than three years. For those well-educated and experienced smartphone users, they should be well-equipped with the basic smartphones skills. As such, the level of smartphone self-efficacy has no association with their dependence on smartphones for achieving understanding goals at work. Smartphone self-efficacy was correlated with orientation and communication dependency relations possibly because these two kinds of dependency are often involved in several new and advanced smartphone functions, such as file editing, video recording, and different kinds of social networking apps. Thus, employees with more smartphone skills were more likely to rely on their smartphones to communicating work-related matters and performing work-related actions. Future studies could further explore which smartphone functions employees tend to rely on in response to their work needs so as to obtain a more in-depth understanding of their relations.

Conscientiousness is another important psychological disposition which was found to influence young Chinese workers' smartphone dependency at work. Conscientiousness is one of the Big-Five personality traits that is characterized by responsibility, caution, achievement, self-discipline, and dutifulness (Anastasi & Urbina, 1997). My findings show that conscientious employees are more likely to be dependent on their smartphones, especially for achieving orientation goals. Previous studies showed that conscientiousness is the important attribute for completing work tasks in all jobs because it represents the personal characteristics such as responsibility and achievement (Barrick & Mount, 1991; Hertz & Donovan, 2000; Ones & Viswesvaran, 1999). According to my results, relying on smartphones for orientation significantly contributed to a better job performance. Thus, when relying on smartphone for meeting orientation goals was perceived to enhance job performance, it is not surprising that workers in high conscientiousness would develop such dependency relation. The reason for not observing any relationship between conscientiousness and understanding dependency, and between conscientiousness and communication dependency might be that some employees with high conscientiousness seldom relied on their smartphone for understanding and communication.

Early work on media dependency in the sociological framework seldom paid attention to the role of individual psychological factors. The findings of current dissertation suggest that media dependency formation processes are more complex than it seems. Psychological factors are also important in engendering individuals' dependency relations with their media. Thus, future research can build on this dissertation to explore more effects of psychological factors on people's smartphone dependency.

7.3 Consequences of Work-related Smartphone Dependency

This dissertation also generated several interesting findings on the consequences of work-related smartphone dependency. It found that smartphone dependence at work not just led to desirable outcomes, such as increased in job performance and in workplace social capital, but also triggered negative consequences, such as smartphone addiction. The positive outcomes are unsurprising as previous studies already reported that using smartphones can greatly increase work efficiency and productivity, as well as strengthen the work relationships of employees by facilitating organizational communication, information sharing, and collaboration (e.g., Chan, 2013; Cohen, 2011; Demerouti et al., 2014; Middleton, 2007). Moreover, these positive consequences indirectly explain the increasing number of companies which encourage the use of smartphone at work (Karlson et al., 2009; Lee et al., 2013). The negative outcome identified is consistent with my expectations as well. MSD theory proposes that as individuals rely on the media more to satisfy his/her needs, the media becomes even more valuable to such individuals, and therefore, the stronger effects those media will have on him or her (DeFleur & Ball-Rokeach, 1989). In relation to the results of this research, the more employees depend on using smartphones for meeting work goals, the more important smartphones are to them. As smartphones become an increasingly important device to workers, it is understandable that many people start to constantly and even uncontrollably check their smartphone status, to become preoccupied with mobile activities, and to experience anxiety without it. These findings are similar to what previous studies indicated as the double-edged sword use of smartphones at the workplace which generated both positive and negative outcomes (Perlow, 2012, Derks & Bakker, 2014; Derks et al., 2014).

The findings on the linkages between work-related smartphone dependency and job performance, workplace social capital, and smartphone addiction also corroborate to the propositions of the MSD theory, which posits that the nature and intensity of media dependency relations cause people to be more or less susceptible to media influences (DeFleur & Ball-Rokeach, 1989). Furthermore, according to Ball-Rokeach (1985), the possible effects of media dependency relations can be cognitive, affective and behavioral. The cognitive consequences include the effects on individual values, attitudes, and beliefs, whereas the affective consequences include the impacts on people's feelings and emotional responses. In my studies, job performance can be viewed as a kind of cognitive outcome as it reflects young workers' beliefs on their job performance; smartphone addiction can be considered as a type of affective impact as it related to the negative feelings and emotions of individuals regarding smartphone use; workplace social capital can be viewed as akin to cognitive and affective outcomes. Thus, the basic claims of MSD theory are proven to be applicable in explaining the consequences of the work-related smartphone dependency of individuals.

Interestingly, this dissertation uncovers that not all dependency relations can influence job performance, workplace social capital, and smartphone addiction. In other words, different dependency relations were found to relate to different outcomes. Specifically, Study 2 shows that only orientation dependency was positively associated with job performance of an employee. This finding makes sense because relying on smartphones to take effective actions at work, such as write/edit files and record important information, could directly increase the work efficiency. Given work efficiency is a predominant indicator of job performance, it is understandable that orientation dependency was positively associated with job performance. The reason

for not observing any association between understanding dependency and job performance might be that the influence of understanding dependency on job performance was mediated by other factors. For instance, current dissertation found that understanding dependency was positively associated with smartphone addiction symptoms. As extant studies reveal that media addiction symptoms would impair the academic performance of college student (Hong, Chiu, & Huang, 2012; Lepp et al., 2014; Lin et al., 2015), it is possible that smartphone addiction symptoms could deteriorate the job performance of workers. Therefore, the effect of understanding dependency on job performance is not direct. The null association between communication dependency and job performance could be that the work-related information for which employees dependent on smartphones to communicate was unimportant. Thus, they might not think relying on smartphones to communicate with coworkers could actually enhance their performance at work. It is also possible that relying on smartphones for communicating work matters is time-consuming, thus cannot effectively increasing the job performance. One global survey may support this explanation. It found that 67 percent of organizational workers who often used email for work-related communication say that they would be more productive if they can communicate with one another in face-to-face settings at work (CIO, 2007). These findings are crucial to the organizations because employees are increasingly dependent on their smartphones for understanding, communicating and orientating at work. The results suggest that, if a company hopes to increase the job performance of their employees, it is advisable to encourage them to rely on smartphones for orientation goals (e.g., perform effective work-related actions).

Moreover, the results of Study 2 showed that only communication dependency can strengthen the workplace social capital of employees. This result makes sense as

depending on smartphone for communicating and interaction work-related matters with other colleagues could directly stimulates social interaction among workers (e.g., Campbell & Kwak, 2010; Chan, 2015; Ling, 2004; Wei & Lo, 2006). This interaction can strengthen colleague-to-colleague relationships and build trust among organizational members, thereby increasing the workplace social capital. Understanding and orientation dependency relations were not found to influence workplace social capital. One possible explanation is that these two dependency types are less involved with social interaction. Given social interaction is the most important approach to increase social capital of individuals, it is not surprising that their understanding and orientation dependency has no influence on workplace social capital of Chinese workers. These results are extremely important as they suggest that, if a company hopes to enhance the workplace social capital of their employees via smartphone system, the most effective way is to stimulate their communication and interaction work-related matter with one another.

Finally, the results reveal that understanding and orientation dependency relations were associated with smartphone addiction symptoms. The more people dependent on their smartphones for understanding or staying informed about work-related matters, and orientating or taking effective work actions, the more likely they were experience smartphone addiction symptoms. The theory of technological addiction may shed light on explaining these findings. It is argued that technological addiction grows when people tend to heavily reliant on the device to attain desirable outcomes, such as expected increase in positive mood (Charlton, 2002). That it, the more individuals use specific technology to obtain desirable outcomes, the more likely they will be addicted to it. Since relying on smartphone for orientation could increase workers' job performance as expected, it is not surprising that orientation dependency

was found to be correlated with smartphone addiction symptoms. Although understanding dependency did not found to increase job performance of workers in current research, the significant association between understanding dependency and smartphone addiction may due to some other favorable outcomes it generates. For instance, relying on smartphones to stay informed and connected with the work-related information may increase a sense of security at work. Thus, the more employees dependent on their smartphones to obtain this sense of security at work, the more likely they will become addicted to them. Further in-depth academic investigation is required to better understanding the associations between individuals' work-related smartphone dependency relations and their smartphone addiction symptoms.

One unexpected finding is that relying one smartphones for communication at work did not influence smartphone addiction symptoms. Such a finding is a bit at odds with prior research suggesting that using smartphone for communication and interaction with others is positively associated with smartphone addiction symptoms (e.g., Bian & Leung, 2015; Lin et al., 2015). One possible explanation may be attributed to the difference between perceived dependency and actual usage of smartphone at work. It could be that some people who perceived themselves highly dependent on smartphones for meeting communication goals at work do not frequently use smartphones to communicate work-related issues with one another in actual working practice. One survey by Forbes Insights supported this explanation as they found that, although young working people thought new technologies bring tremendous convenience to business communication, majority of them still preferred face-to-face communications in business practice (Fusion, 2009). Therefore, the effect of communication dependency might be mediated by the actual smartphone usage for communication purposes on addiction symptoms. This finding is crucial as it raised an

important link among dependency, actual usage, and addiction. Another possible explanation for this null significant association may be that, although depending on smartphones for communication could increase workplace social capital of workers, this outcome is not expected by the workers. According to the theory of technological addiction, technological addiction grows when people tend to heavily reliant on the device to attain expected outcomes (Charlton, 2002). As increased workplace social capital is not a desirable outcome of their dependence on smartphones for communication, it is not surprising that communication dependency had no association with smartphone addiction. Future studies could continue to explore this association by utilizing different study designs and samples.

7.4 Major Theoretical, Methodological, and Practical Contributions

By employing interviews and online surveys to understand work-related smartphone dependency of young working adults in China, this dissertation achieved several important theoretical, conceptual, methodological and practical contributions.

First, this dissertation significantly contributes to the understanding of the smartphone dependency of young adults at work settings. In recent years, smartphone dependency has become a widespread social phenomenon attracting increased attention from health workers and researchers. Abundant academic research on smartphone dependency has been conducted over the past few years (e.g., Ahn et al., 2015; Chen et al., 2015; Harun et al., 2015; Lapierre & Lewis, 2016; Lin et al., 2015; Lin et al., 2014; Park et al., 2013; Suki & Suki, 2013; Ting et al., 2011). However, majority of them have been focusing on adolescents or university students. Considering that the use of smartphones for day-to-day work is now common for employees of various organizations, the increasing need to scholarly investigate

smartphone dependency at work settings has become evident. This dissertation is among the first to respond to this need by examining smartphone dependency among employees, with special focus on their work-related smartphone dependency. Thus, the findings of present dissertation contribute to the alarming literature on smartphone dependency in the work domain.

Second, this dissertation provided a new theoretical perspective to understand individual's smartphone dependency, as well as its antecedents and consequences. Most previous smartphone dependency studies have focused primarily on examining smartphone dependency's psychological antecedents such as sociability and locus of control, but seldom paying attentions to those social structural factors. In addition, majority of them have examined either antecedents or consequences, but seldom both. This dissertation overcomes these limitations by applying the MSD theory as its theoretical foundation. Suggested by the MSD theory, individual's media dependency is a multi-dimensional conduct which can be affected by several social-structural factors. Thus, this dissertation investigated a variety of social structural antecedents, in addition to psychological ones. It revealed that different kinds of work-related smartphone dependency relations were associated with different task characteristics, organizational norm, levels of managerial support, and psychological factors (e.g., conscientiousness and smartphone self-efficacy). Examining both the social structural and psychological factors provided a more complete picture for understanding the origins of smartphone dependency. Besides, directed by the MSD theory, this dissertation examined how different types of smartphone dependency relations at work are associated with various cognitive, affective, and behavioral outcomes. It demonstrated that different dependency relations were associated with different intended and unintended outcomes (e.g., job performance, workplace social capital,

and smartphone addiction). These findings greatly expand our knowledge on smartphone dependency and add new literature to the topic of smartphone dependency.

Third, this dissertation extends the application of MSD theory to organizational and new media contexts. To the best of my knowledge, scant research has examined the MSD theory within the work settings. This dissertation is among the first to employ MSD theory in a work situation and identify specific work-related antecedents (e.g., task characteristics and organizational factors) and outcomes (e.g., job performance and workplace social capital) of workers' smartphone dependency. The variables identified in this dissertation can be further used in the future media dependency research at similar organizational settings. Besides, by examining the antecedents and outcomes of work-related smartphone dependency, this dissertation provides evidences to support that the major claims of the MSD theory are applicable in explaining individual-smartphone dependency relations at work. For instance, present studies were consistent with the arguments of the MSD theory by finding that the intensity of individual-smartphone dependency relations is largely determined by the social structural environment of employees beyond their individual control. Thus, theoretical application of the MSD theory is extended to the smartphone media and organizational context.

Fourth, this dissertation also contributes new knowledge to the MSD theory in several ways. Over the past decade, extant studies have employed MSD theory to understand new media dependency (e.g., Ognyanova & Ball-Rokeach, 2015; Patwardhan & Yang, 2003; Sun et al., 2008). However, majority of them did not pay attention to the changes of media dependency relations in a new media environment. By using a mix-method approach, this dissertation is among the first to emphasize such

changes. The findings suggest that, unlike traditional media systems where individuals need to rely on media to provide information about their social environment, the individual-media relationship in the smartphone media environment is changed, becoming flexible, interchangeable, and multi-dimensional. People no longer merely rely on smartphone as to provide information about their social environment, but also depend on the multi-functional smartphone platform to communication and perform activities. Thus, when future studies attempt to employ the MSD theory to understand individual's smartphone dependency relations, they are suggested to pay attention to these changes and use valid instruments to measure them, so as to obtain accurate knowledge of smartphone dependency. Besides, the traditional MSD framework mainly focuses on the social structural influences on media dependency relations. This dissertation contributes to the improvement of the MSD theory by showing that the forming process of individuals' media dependency relations is much more complex than it seems. Except for social structural factors in people's social environment, individual's media dependency is also a function of their psychological dispositions. All of these findings strengthened the theoretical framework of the traditional MSD theory.

Fifth, this dissertation contributes to extant new media research by demonstrating that smartphone dependency and smartphone addiction are two fundamentally different concepts that should be separately examined in future studies. Smartphone dependency is a relation-based concept that emphasizes on the dependency relationship between individuals and their smartphones. It is a neutral concept and every one should has different levels of dependency on their smartphone. However, smartphone addiction is a negative concept that emphasizes on the psychological symptoms resulted from problematic and pathological smartphone usage. This dissertation is one of the pioneers to clearly differentiate these two concepts, and to further explore the relationship between them. The results show that

not all work-related smartphone dependency relations result in smartphone addiction. Only depending on smartphone for understanding and orientation purposes are likely trigger addiction symptoms. This suggests that future studies should use different conceptual and operational definitions of the two distinct concepts when examine their antecedents and impacts.

Sixth, this dissertation provides comprehensive picture of the current status of smartphone dependency at work settings in the Chinese context. As smartphones have become overwhelming popular for day-to-day working practices globally, numerous western scholars may have also started to pay attention to work-related smartphone dependency in their countries. The findings of this dissertation can be used for cross-cultural comparisons, which can further benefit the understanding of work-related smartphone dependency in different cultural contexts.

Moreover, this dissertation presents important methodological contributions. This study is among the first to employ a mixed method research design in examining the individual-smartphone dependency relations. This mixed method approach contributed a more comprehensive, in-depth, and accurate understanding of smartphone dependency than previous survey-based research. For instance, this dissertation identified new smartphone dependency relation at work settings and uncovered the unexpected significant influence of managerial support on employees' smartphone dependency relations through the interview study. In addition, by using both qualitative and quantitative approaches, this dissertation developed fairly valid and reliable instruments for measuring most variables, and those adequate instruments significantly contribute to the accuracy of my findings. Besides, my data were collected from organizational workers at multiple organizations in multiple industries. Also, to improve the data quality, I have intentionally distributed the survey to the

workers in different locations. Thus, the empirical results of this dissertation can be more generalizable than other empirical studies relying on a small dataset gathered from a single organization or single industry.

In practice, this dissertation initially alert employers to the existence of work-related smartphone dependency among their employees. As such dependency, which is relatively intensive among young workers, can lead to both positive and negative consequences, employers and companies should pay attention to it. Moreover, the findings of present dissertation can assist the employers and companies to better understand how and why their workers dependent on smartphones at work, and what are the consequences of such dependency. With such knowledge, employers and management teams can design effective strategies to respectively maximize and minimize positive and negative consequences of the work-related smartphone dependency of their employees. For instance, this dissertation shows that managerial support could shape the dependency relations between employees and their smartphones at work. Thus, for organizations preferring to intervene in their employees' smartphone dependency at work, it is important that top management take a visible stand on smartphone use at work. They may consider making a statement for encouraging the smartphone use at work or providing some pragmatic supports like reimburse phone bills or offer phone bill allowance for their use. Moreover, this dissertation shows that relying on smartphone for orientating or taking effective work-related actions (e.g., write/edit documents, collect/record work-related information) could significantly increase the job performance of workers. It suggests that it may be worthwhile for organizations to promote this type of smartphone dependency among their workers. For instance, companies may consider designing tutorial programs to

increase workers' smartphone skills, so as to increase their reliance on smartphones to take effective work-related actions.

7.5 Limitations and Directions for Future Research

Although this dissertation was carefully designed and executed, some limitations still exist. In the following sections, I will elaborate the limitations of Study 1 and Study 2 first, and then provide additional future research directions.

7.5.1 Limitations

7.5.1.1 Study 1

Study 1 has several limitations that can be overcome in future research. First, a selection bias existed when I recruited interviewees from personal social networks. Despite the efforts made to recruit as homogenous young working adults as possible, these easiest-to-approach participants were those who are related to the researcher so they might share similarities in personality and social resources such as high educational attainment. These could influence the interview results.

Second, different interview technologies, such as face-to-face and Skype calls, are used in Study 1. Interviews via Skype restricted me in capturing some important contextual information from the interviewees. Having recognized this limitation before starting Study 1, I tried my best to conduct personal interviews in face-to-face settings as much as possible. However, as a doctoral student studying in Singapore, I found it is difficult for me to face-to-face interview all 32 respondents work in different locations around China. Future studies with sufficient time and budget are recommended to conduct all interviews in a face-to-face setting to ensure the validity of the results.

Third, the interviews are conducted in Chinese and are translated into English when reporting the results. Although the translation was done thoroughly, specifically those that are related to key constructs, the risk of losing certain cultural or social meanings in the translation process remains. For future studies, researchers should be aware of this risk and consider recruiting a few bilingual experts to double check the accuracy of the translation.

7.5.1.2 Study 2

Likewise, several issues in Study 2 should be addressed and overcome in future research. First off, using a non-probability sampling technique, the convenience sample recruited in Study 2 prevented estimations of response rate estimations, caused sampling error and non-response bias, and thus, limited the results generalization. More importantly, due to the snowballing sampling approach, my sample cannot fully represent the young working adult population in China. They tend to be better educated and higher income groups, and are restricted to limited professional roles. Thus, the results of this dissertation should be interpreted and generalized with caution. However, given priori power analysis suggested that my sample of 527 respondents has sufficient statistical power to test the theoretical links between the variables, I am confident that my research as a preliminary exploration provided significant knowledge on understanding the smartphone dependency relations among young employees. In the future, with sufficient budget and enough social connection with organizations around China, I will attempt to use a random sampling method in selecting participants to guarantee the generalizability of the results.

Second, the cross-sectional data used in Study 2 only captured a snapshot of the dynamic opinions of respondents. On the one hand, although the relationships

among the variables used in this study are founded on strong theoretical argumentation and the empirical results from Study 1, such data collection approach still limited the extent to which I can lay claims about the causal relationships among the variables. To rigorously establish the direction of causality, strict experimental designs and longitudinal data should be used in future studies. On the other hand, fast technological advancements constantly change the nature and scope of smartphone activities, which may alter the nature and scope of dependency relations as well. Thus, the cross-sectional approach adopted in this study cannot sufficiently reflect such long-term development process. Therefore, a longitudinal or time-series analysis of smartphone dependency at work can provide us with a more consistent understanding of the development of individual-smartphone relations at work over time.

Third, Study 2 investigated the work-related smartphone dependency of young working adults in mainland China, which may restrict the generalizability of the results to other age groups and other countries. Future studies can investigate this topic in a different population and examine the differences among them. In light of the above-mentioned limitations, the results of this dissertation should be interpreted and generalized with caution.

7.5.2 Other Future Research Directions

Despite the above shortcomings, the findings of current dissertation also suggest future research agendas.

One interesting future direction is to study the role of cultural value in affecting and shaping individuals' smartphone dependency at work. Although smartphone use at work is now a common phenomenon across many countries, the manner by which people develop dependency on smartphones and their reasons for

being so may differ across cultures. Asian cultures, such as the Chinese and Korean culture, which have a Confucian background, exhibit considerably high levels of collectivism. By contrast, individualism is commonly observed in Western cultures, such as that of the United States (Cho et al., 1999; Hofstede, 1984). Previous studies have shown that different cultural values have significantly influenced the people's use of media. Kim and Yun (2007) found that the frequent social media use of South Koreans was closely related to the collectivistic culture of South Korea. In the current dissertation, the significant influence of organizational norm on smartphone dependency may be related to the collectivistic culture of China as well. As such, it will be interesting for future studies to investigate the impact of cultural values on individuals' dependence on smartphones at work.

Organizational factors are significant antecedents of smartphone dependency at work. In this dissertation, I only analyzed organizational norm and managerial support. In the future, specific organizational factors (e.g., organizational policy regarding smartphone use at work and organizational climate) could be assessed in the context of work-related smartphone dependency. For instance, Derks et al. (2014) found that if an organization had a blur boundaries between work and private life, people within this organization are likely to use smartphones to deal with work-related tasks during non-working hours. Thus, it may be worthwhile for future studies to investigate the influence of organizational climate on work-related smartphone dependency to gain substantial insights into why employees are dependent on smartphones at work.

As a multimedia gadget, a smartphone has a variety of functions. To obtain an in-depth understanding of the topic of smartphone dependency, it may be worthwhile for future studies to take a close look at individuals' dependency on various smartphone functions (e.g., voice calling, email, Internet browsing, instant messaging,

social media, memo function, and calendar). In particular, future studies can further explore how the uses of these functions are associated with smartphone dependency at work. Moreover, several respondents in my Study 1 emphasized the importance of WeChat in work settings. However, due to the focus of my current dissertation, I did not examine how different types of mobile social media use are associated with the smartphone dependency of Chinese workers at work in my Study 2. Given that previous studies have shown that features and affordances of social media matter in people's interactions with different social media platforms (Treem & Leonardi, 2013; Majchrzak, Faraj, Kane, & Azad, 2013), it may be meaningful for future studies to further explore how mobile social media are used in work settings. Moreover, future studies may investigate how different types of mobile social media (e.g., WeChat, Weibo, Facebook, Mobile QQ) are associated with smartphone dependency at work.

The insignificant associations between dependency relations and outcome variables need further investigation. For instance, this dissertation found that job performance was affected by orientation dependency but not understanding dependency. However, the reason is unclear why relying on smartphones to understand work-related matters had no influence on job performance. Given that the current dissertation also found that understanding dependency was positively associated with the symptoms of smartphone addiction, future research may focus on analyzing if smartphone addiction mediated the relationship between understanding dependency and job performance. Furthermore, to obtain an improved understanding of the associations between work-related smartphone dependency relations and outcomes, future studies may consider analyzing the mediating role of the actual use of smartphones for different work-related purposes. The results of my Study 2 indicated that communication dependency had no association with the symptoms of

smartphone addiction. Accordingly, future studies may examine if the actual use of smartphones for communication mediated the relationship between communication dependency and smartphone addiction.

This dissertation targeted the general population of young working adults. However, the type of occupation can influence the intensity of smartphone dependency of employees at work. For example, the interview results of my Study 1 indicated that salespersons may exhibit a higher level of dependency on their smartphones for work reasons compared with academic workers. In the future, researchers could examine the work-related smartphone dependency of young workers in different occupations (e.g., salesperson, media worker, health worker, admin workers), as well as compare the intensity of their dependency relations. Consequently, the analysis of the work-related smartphone dependency could go deeper.

Besides, this dissertation centered on young Chinese workers in urban cities. Given the proliferation of smartphones, as well as the economic and social development in rural areas, future research should also consider conducting similar investigations in rural areas to compare the differences in work-related smartphone dependency between rural areas and urban cities in China. In addition, it is well known that there are some differences between interior and coastal cities in China. For example, the 3G and 4G networks in most coastal cities, such as Guangzhou and Shanghai, are significantly mature and cover large areas. However, the development of the same networks in several interior cities, such as Yunnan and Guizhou, is still in the early stage with comparatively low coverage rate (Ministry of Industry and Information Technology of China, 2016). Such contextual differences between interior and coastal cities can also influence the smartphone use and reliance at work of young

Chinese workers. To gain a more comprehensive understanding of young Chinese workers' smartphone dependency, future research should consider examining such dependency in different city districts, and compare the differences between interior and coastal cities.

7.6 Concluding Remarks

Nowadays, the role of smartphone in facilitating a wide variety of working practices has become increasingly important. This dissertation was a preliminary step in examining individual-smartphone dependency at work. It supports several general arguments: 1) Traditional media dependency relations were changing in a smartphone media environment; 2) Traditional media dependency relations were not fully applicable to specific working contexts; 3) Social structural factors significantly influenced individual-smartphone dependency relations at work, however, their influences on each dependency relation is different; 4) Smartphone dependency at work was not merely triggered by individuals' social structural environment, but also a function of their psychological dispositions; 5) Different work-related smartphone dependency relations were associated with different consequences.

Although the findings of this dissertation may be limited to young working people in China, they provide new significant information from a media dependency perspective on particularistic connections between individuals and their smartphone in work settings. Such information is notably useful to media scholars and practitioners in assessing the work-related smartphone dependency of young working adults in China, as well as provide future studies with a solid foundation to examine similar phenomenon elsewhere.

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APPENDIXES

Appendix A

Interview Guide

Good day to you!

My name is Li Li, from Wee Kim Wee School of Communication and Information at Nanyang Technological University. I am conducting this interview regarding Chinese working adults' work-related smartphone dependency and your participation will be useful in helping me gain a better understanding in this topic. This interview will take you less than one hour. All of your responses will be kept confidential and for research purposes only. Thank you!

Warm-up Questions	
Warm-up questions	<ol style="list-style-type: none"> 1. What kind of job are you working on (e.g., salesmen, engineer, secretary ...)? 2. Do you think smartphone is an important device for your work? Why or why not? 3. How often do you use your smartphone at work? What kinds of smartphone functions you use most frequently at work? Why? 4. In your opinion, to what extent do you depend on your smartphone at work?
Dependency Relations	
General questions	<ol style="list-style-type: none"> 1. How can smartphone help you in your work? Can you elaborate it? 2. In general, what kinds of goals do you depend on your smartphone to fulfill at work?
Specific questions	<ol style="list-style-type: none"> 3. Do you think smartphone can help you to understand your work better? If yes, how it can help you? 4. Do you think smartphone can guide your behaviors or help you take work-related action effectively? If yes, how it can help you? 5. Do you think smartphone can help you to entertain or escape from reality at work? If yes, how it can help you?
Possible Antecedents	
General questions	<ol style="list-style-type: none"> 1. Based on your own experience, why do you become dependent on your smartphone at work? 2. Based on your own experience, what are the factors affecting your dependency on smartphone at work? How they affect? 3. Based on your own experience, does some of your work-related factors affect your smartphone dependency at work? If yes,

	<p>what are they? How they influence your work-related smartphone dependency? If no, why?</p> <p>4. Based on your own experience, does some of your individual psychological traits affect your smartphone dependency at work? If yes, what are they? How they affect your work-related smartphone dependency? If no, why?</p>
Work-related factors (specific questions)	<p>5. Are you often required to cooperate and coordinate with others in order to finish your work? If yes, does this task characteristic intensify your smartphone dependency at work? Why? [<u>task interdependence</u>]</p> <p>6. Are you often required to carry out job tasks in different locations? If yes, does this task characteristic intensify your smartphone dependency at work? Why? [<u>task mobility</u>]</p> <p>7. Are you often required to react or perform job tasks promptly? If yes, does this task characteristic intensify your smartphone dependency at work? Why? [<u>time criticality</u>]</p> <p>8. How your colleagues use smartphones? Does using smartphones for handling work-related matters become a norm in your workplace? If yes, does such norm intensify your smartphone dependency at work? Why? [<u>organizational norm</u>]</p>
Psychological dispositions (specific questions)	<p>9. Do you think you are a person who has a high level of proficiency in smartphone use? If yes, whether this trait affects your smartphone dependency at work? How it affects? [<u>Smartphone self-efficacy</u>]</p> <p>10. Do you think you are an extraverted person (e.g., sociable, active, and talkative)? If yes, whether this trait affects your smartphone dependency at work? How it affects? [<u>Extraversion</u>]</p> <p>11. Do you think you are a neurotic person (e.g., often feel anxious, sad, and are sensitive to others' responses)? If yes, whether this trait affects your smartphone dependency at work? How it affects? [<u>Neuroticism</u>]</p> <p>12. Do you think you are an agreeable person (e.g., very cooperative, and friendly to others)? If yes, whether this trait affects your smartphone dependency at work? How it affects? [<u>Agreeableness</u>]</p> <p>13. Do you think you are a conscientious person (e.g., responsible, dutiful, and reliable)? If yes, whether this trait affects your smartphone dependency at work? How it affects? [<u>Conscientiousness</u>]</p> <p>14. Do you think you are a very open person (e.g., likes to try new things, prefer novelty)? If yes, whether this trait affects your smartphone dependency at work? How it affects? [<u>Openness</u>]</p>

Possible Consequences	
General questions	1. In general, what are the consequences of your work-related smartphone dependency? Can you elaborate both positive ones and negative ones?
Specific questions	<p>2. Does your work-related smartphone dependency influence your job performance? If yes, how it affects your job performance? If no, why? [<u>Job performance</u>]</p> <p>3. Does your work-related smartphone dependency influence your workplace social capital (e.g., relationships with colleagues, understanding and trust among organizational members)? If yes, how it affects your workplace social capital? If no, why? [<u>Workplace social capital</u>]</p> <p>4. How do you think the relationship between smartphone dependency and smartphone addiction? Does your work-related smartphone dependency led you to have some smartphone addiction symptoms? If yes, how it affects your addiction symptoms? What kinds of smartphone addiction symptoms you experienced? If no, why? [<u>Smartphone addiction</u>]</p>
Demographics	
Specific questions	<p>1. How old are you?</p> <p>2. What is the highest degree you obtained?</p> <p>3. What is your current marital status?</p> <p>4. What kind of industry you are working in?</p> <p>5. What is your company size? E.g., how many employees in your company?</p> <p>6. How many years have you worked?</p> <p>7. What job position you are in? Junior staff worker? Senior staff worker? Or Manager?</p>

Appendix B

Interview Guide (Chinese Version)

采访提纲

您好！

我的名字叫黎黎，是来自新加坡南洋理工大学黄金辉传播与信息学院的博士候选人。我现在正在进行一个关于中国年轻人在工作中对智能手机的依赖性的采访。您的参与可以帮助我对这个课题有更深入的了解。这次采访耗时不会超过一小时，您的所有回答都将会保密并且仅为学术研究使用。

谢谢！

热身问题	
热身问题	<ol style="list-style-type: none">1. 请问您是做什么工作的(销售人员，工程师，秘书...)?2. 对您的工作来说，智能手机是个很重要的工具吗？为什么？3. 您在工作上用智能手机的时候多吗？在工作中，哪种手机功能您使用最频繁（e.g., 手机邮件，微信，电话。。。）？为什么使用如此频繁？4. 在您的工作关系圈中，您最常用手机和谁联系？为什么？5. 您觉得您在工作中对智能手机的依赖程度怎么样？依赖程度高吗？
依赖的关系	
综合问题	<ol style="list-style-type: none">1. 智能手机是如何帮助您的工作的？能详细和我说一下吗？2. 在工作中，您一般依赖智能手机来做什么？能详细和我说一下吗？
具体问题	<ol style="list-style-type: none">3. 您觉得智能手机能帮助您更好的了解您的工作吗？如果能，它是如何帮助您的？4. 您觉得智能手机能够引导您的行为或者是帮助能更有效的完成工作吗？如果能，它是如何帮助您的？5. 您觉得在工作中，智能手机能帮助您娱乐或者逃离现实？如果能，它是如何帮助您的？
可能的诱因	
综合提问	<ol style="list-style-type: none">1. 根据您的经验，您为什么在工作中依赖智能手机？或者说，导致您依赖智能手机来处理工作的主要原因是什么？请举几个例子。2. 根据您的经验，是否一些工作方面相关的因素会影响您在工作中对智能手机的依赖？如果是，请问是哪一些工

	<p>作相关的因素？他们是如何影响您在工作中的手机依赖的？如果不是，为什么？</p> <p>3. 根据您的经验，是否一些您个人的心理因素会影响您在工作中对智能手机的依赖？如果是，请问是哪一些个人的因素？他们是如何影响您在工作中的手机依赖的？如果不是，为什么？</p>
<p>工作相关因素 (具体问题)</p>	<p>4. 您的工作是否经常要与别人合作或协商？如果是，在这样情况下智能手机是否是必须的？它会怎样帮助您？这样工作特点是否让您在工作中更加依赖手机？为什么？ [任务依存性]</p> <p>5. 您的是否经常要在不同的地方进行工作？如果是，面对这种情况手机是否是必须的？它会怎样帮助您？这样工作特点是否让您在工作中更加依赖手机？为什么？ [任务移动性]</p> <p>6. 您的是否经常要立即处理一些紧急的工作？如果是，面对这种情况手机是否是必须的？它会怎样帮助您？这样工作特点是否让您在工作中更加依赖手机？为什么？ [任务时效性]</p> <p>7. 您的同事都是怎样使用他们的手机的？他们是否也常常用手机来处理工作相关的事情？通过手机来处理工作相关的事务是否已成为你们单位的一种规范？您的公司/单位(例如：领导, 同事 & 客户) 是否总是期望你的电话能保持畅通，及时回复他们，即使你在周末或处于休假中？如果是，这种规范是否会让您在工作中更加依赖手机？为什么？ [组织规范]</p>
<p>个人心理特点 (具体问题)</p>	<p>8. 您觉得您是不是一个使用手机非常娴熟的人，或者说您觉得您是否能使用手机来满足您绝大部分的需求？如果是，你觉得这种特质会不会影响您在工作中对智能手机的依赖？它是怎样影响的？可以和我详细说一下吗？ [手机自我效能感]</p> <p>9. 您觉得您是不是一个外向的人，例如好交际，活跃和喜欢和别人聊天？如果是，你觉得这种特质会不会影响您在工作中对智能手机的依赖？它是怎样影响的？可以和我详细说一下吗？ [外向性]</p> <p>10. 您觉得您是不是一个神经敏感的人，例如经常感到焦虑，难过，对他人的反馈很敏感？如果是，你觉得这种特质会不会影响您在工作中对智能手机的依赖？它是怎样影响的？可以和我详细说一下吗？ [敏感性]</p> <p>11. 您觉得您是不是一个亲和的人，例如有合作精神，对他人友好？如果是，你觉得这种特质会不会影响您在工作中对智能手机的依赖？它是怎样影响的？可以和我详细说一下吗？ [亲和性]</p>

	<p>12. 您觉得您是不是一个尽职尽责的人，例如非常有责任感和可靠？如果是，你觉得这种特质会不会影响您在工作中对智能手机的依赖？它是怎样影响的？可以和我详细说一下吗？ [尽责性]</p> <p>13. 您觉得您是不是一个开放的人，例如喜欢新奇，尝试新的东西？如果是，你觉得这种特质会不会影响您在工作中对智能手机的依赖？它是怎样影响的？可以和我详细说一下吗？ [开放性]</p>
可能带来的影响	
综合问题	1. 总的来说，在工作对智能手机的依赖给您带来了哪些影响？可已从正反两方面的影响和我说一说吗？
具体问题	<p>2. 在工作中对智能手机的依赖会影响你的工作表现吗？如果会，是如何影响的？如果不会，为什么？ [工作表现]</p> <p>3. 在工作中对智能手机的依赖会影响你的工作中的社会资本吗（例如和同事的关系，同事间的理解信任度等）？如果会，是如何影响的？如果不会，为什么？ [工作社会资本]</p> <p>4. 您是如何看待手机依赖和手机成瘾的关系的？您觉得在工作中对智能手机的依赖会导致您产生智能手机成瘾的症状吗？如果会，您有哪些成瘾的症状产生？是如何影响的？如果不会，为什么？ [智能手机成瘾]</p>
个人信息	
具体问题	<p>1. 请问您今年多大了？</p> <p>2. 请问您目前的学历是什么？</p> <p>3. 请问您目前的婚姻状况是？</p> <p>4. 请问您现在正在做哪个行业？</p> <p>5. 请问您目前的工作类型是什么？</p> <p>6. 请问您目前的公司规模有多大，例如有多少员工？</p> <p>7. 从开始工作算起，请问您现在工作几年了？</p> <p>8. 请问您现在的工作职位是什么？是初级职员，中级职员，还是管理层？</p>

Appendix C

Consent Form

Interview for Work-related Smartphone Dependency among Young Working Adults in China

Dear Participant,

We want to thank you for taking the time to talk with us today. We are conducting this interview as part of Li Li's PhD thesis on examining work-related smartphone dependency, among young working adults in China.

The interview should take less than one hour. We will be taping the session because we don't want to miss any of your comments. Because we're on tape, please be sure to speak up so that we don't miss your comments.

All responses you provide will be kept confidential and only used for academic purposes. Results of this study may be presented at conferences and/or published in books, journals, and/or in the popular media. However, we will ensure that any information included in my report does not identify you as the respondent.

Remember, your participation in this study is completely voluntary. You don't have to talk about anything you don't want to and you may end the interview at any time. Your decision to participate, decline, or withdraw participation will have no effect on your status.

Thanks a lot for your participation! If you have questions about this study, please feel free to contact Li Li or her supervisor Dr. Trisha T. C. Lin or at the following address.

Li Li

PhD Candidate in Communication
Wee Kim Wee School of Communication and Information,
Nanyang Technological University, Singapore
Tel: 65-67906971
Email: lili0026@e.ntu.edu.sg

Trisha T. C. Lin, Ph.D.,

Assistant Professor,
Wee Kim Wee School of Communication and Information,
Nanyang Technological University, Singapore
Email: trishalin@ntu.edu.sg

Note: If you have any concerns about this study or your experience as a participant, you may contact the Institutional Review Board (IRB) at NTU at 65-65922495 (collect calls will be accepted if you state you are a study participant); email: irb@ntu.edu.sg.

I have read the above information and give my consent to participate in this study.

- Yes
- No

Appendix D

Consent Form (Chinese Version)

知情同意书

关于中国年轻人在工作中对智能手机依赖情况之采访

尊敬的受访者，

感谢您今天抽出时间参与这次采访。此次深度采访作为黎黎博士论文的一部分，旨在调查中国年轻人在工作中对智能手机依赖的情况。

采访将会占用您不到1个小时的时间。由于不希望错过您的发表的观点，采访将会被录音。由于录音的需要，请您尽量放大音量，以帮助我清晰准确地记录下您的言论。

您所有的言论都将会保密并且仅为学术研究之用。研究的结果可能会在学术会议上展示，也可能在书籍，杂志等其它媒体上发表。但是，我们保证这些展示或者发表都不会泄露任何您的个人信息。

请注意，您的本次参与是完全自愿的。您有权不回答任何您不愿告知的问题。并且，您有权随时终止这次采访。你是否参与，终止或者拒绝本次采访都不会对您的工作或者生活造成任何影响。

非常感谢您的参与！若有任何关于本次采访的问题和困惑，请随时通过以下地址和黎黎或她的导师 Dr. Trisha T. C. Lin联系。

黎黎
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注意：本次研究已经通过了南洋理工大学机构审查委员会的批准，如果您对此研究或作为调查参与者的权益有任何问题，欢迎随时和新加坡南洋理工大学机构审查委员会联系：65-65922495，邮件：irb@ntu.edu.sg

我已经了解上述信息并同意参加这次访谈。

- 是
- 否

Appendix E

Approval Letter of IRB (Interview study)



Research Support Office

Reg. No. 200604303R

IRB-2014-12-013

29 January 2015

Assistant Professor Lin Tsui-Chuan, Trisha
Wee Kim Wee School of Communication and Information

NTU INSTITUTIONAL REVIEW BOARD APPROVAL

Project Title: Work-related mobile phone dependency among young working adults in China: an examination of predictors and impacts

(Amount Approved: SGD\$3,000; to be funded by WKWSCI 3K grant program)

I refer to your application for ethics approval with respect to the above project.

The Board has deliberated on your application and noted from your application that your research involves collecting behavioral data from participants using surveys or interviews.

You have also confirmed that informed consent will be obtained from the participants and you have guaranteed the confidentiality of your participants' biodata obtained from them.

The documents reviewed are:

- a) NTU IRB application form dated **24 December 2014**
- b) Participant information sheet and consent form: version 1 dated **24 December 2014**
- c) Data collection form: version 1 dated **24 December 2014**

The Board is therefore satisfied with the bioethical consideration for the project and approves the ethics application under **Expedited** review. The approval period is from **29 January 2015 to 28 January 2016**. The NTU IRB reference number for this study is **IRB-2014-12-013**. Please use this reference number for all future correspondence.

The following protocol and compliances are to be observed upon NTU IRB approval

1. All research involving procedures greater than minimal risk on minors (individuals who are less than the legal age of 21 years old) requires IRB approved written Parental Consent and assent from the participant to be obtained before any research protocols can be administered. Minimal risk refers to an anticipated level of harm and discomfort that is no greater than that ordinarily encountered in daily life, or during the performance of routine educational, physical, or psychological examination.
2. Only the approved Participants Information Sheet and Consent Form should be used. It must be signed by each subject prior to initiation of any protocol procedures. In addition, each subject should be given a copy of the signed consent form.

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Tel: +65 6791 9857, Fax: 6793 2019
www.ntu.edu.sg



Research Support Office

3. Consent forms are important documents therefore they should be stored in the strictest arrangement. Loss of consent form would result in disciplinary action.
4. No deviation from, or changes of, the protocol should be initiated without prior written NTU IRB approval of an appropriate amendment.
5. The Principal Investigator should report promptly to NTU IRB regarding:
 - a. Deviation from, or changes to the protocol.
 - b. Changes increasing the risk to the subjects and/or affecting significantly the conduct of the trial
 - c. All serious adverse events (SAEs) which are both serious and unexpected.
 - d. New information that may affect adversely the safety of the subjects of the conduct of the trial.
 - e. Completion of the study.
6. Continuing Review Request/ Notice of Study completion form should be submitted to NTU IRB for the following:
 - a. Annual review: Status of the study should be reported to the NTU IRB at least annually using the Continuing Review Request/ Notice of Study completion form.
 - b. Study completion or termination: Continuing Review Request/ Notice of Study completion form is to be submitted within 4 to 6 weeks of study completion or termination.

A handwritten signature in black ink, appearing to read "Lee Sing Kong".

Professor Lee Sing Kong,
Chair, NTU Institutional Review Board
encl.

cc Chair, Wee Kim Wee School of Communication and Information
Members, NTU Institutional Review Board

Appendix F

Survey Questionnaire

SECTION I –SMARTPHONE USE

1. Are you an smartphone user?
 - Yes
 - No

2. How long have you been using the smartphone? (from your first smartphone)
 - Less than 1 year (include 1 year)
 - Between 1 year to 3 years (include 3 years)
 - Between 3 years to 5 years (include 5 years)
 - Between 5 years to 7 years (include 7 years)
 - More than 7 years

3. What kind of smartphone you are using?
 - Samsung
 - Apple
 - Xiaomi
 - Huawei
 - Others

4. On average, how much time you spent using your smartphone for **work reasons** per day?
 - Less than 1 hours
 - Between 1 hour to 2 hours (include 1 hour)
 - Between 2 hours to 3 hours (include 2 hours)
 - Between 3 hours to 4 hours (include 3 hours)
 - More than 4 hours (include 4 hours)

5. Please *circle* the answer to the following statements which can best describe how frequently you use the following smartphone functions **for work reasons.**

Scale: 1=*Never* 2=*Almost Never* 3=*Sometimes* 4=*Fairly Often* 5=*Very Often*

- | | | | | | |
|---|---|---|---|---|---|
| a. How often do you use your smartphone to <u>call others</u> for work reasons? | 1 | 2 | 3 | 4 | 5 |
| b. How often do you use your smartphone to <u>send SMS</u> for work reasons? | 1 | 2 | 3 | 4 | 5 |
| c. How often do you use your smartphone to check/send work-related <u>emails</u> ? | 1 | 2 | 3 | 4 | 5 |
| d. How often do you use your smartphone <u>browser to search</u> work-related information? | 1 | 2 | 3 | 4 | 5 |

- e. How often do you use mobile microblogging services (e.g., Weibo) **for work reasons?** 1 2 3 4 5
- f. How often do you use mobile instant messaging services (e.g., Wechat, mobile QQ) **for work reasons?** 1 2 3 4 5

SECTION II – WORK-RELATED SMARTPHONE DEPENDENCY

6. Please *circle* the answer to the following statements which can best describe how helpful is the Smartphone for your work.

Scale: 1=*Not at all* helpful 2=*Rarely* helpful 3=*Occasionally* helpful
 4=*Often* helpful 5=*very* helpful

In your work, how helpful is the smartphone to

Understanding

- a. stay on top of what is happening at work. 1 2 3 4 5
- b. find out work-related matters. 1 2 3 4 5
- c. keep up with work-related events. 1 2 3 4 5

Orientation

- d. document work-related materials. 1 2 3 4 5
- e. edit work-related files. 1 2 3 4 5
- f. record work-related information. 1 2 3 4 5
- g. guide work-related activities. 1 2 3 4 5

Communication

- h. discuss work-related matters with others. 1 2 3 4 5
- i. maintain contacts with the people you work with. 1 2 3 4 5
- j. interact with your colleagues, clients/ customers for work. 1 2 3 4 5

SECTION III – ANTECEDENTS

Task Attributes & Organizational Norm

7. Please *circle* the answer to the following statements which can best describe how you feel towards your work.

Scale:	1= <i>Strongly Disagree</i>	2= <i>Disagree</i>	3= <i>Neutral</i>		
	4= <i>Agree</i>	5= <i>Strongly Agree</i>			

Task interdependence

- a. My task can be performed fairly independently of others) e.g., colleagues, clients, & co-workers). 1 2 3 4 5
- b. My task can be planned with little need to coordinate with others. 1 2 3 4 5
- c. It is rarely required to obtain information from others to complete my task. 1 2 3 4 5
- d. My task is relatively unaffected by the performance of other individuals or departments. 1 2 3 4 5
- e. My task requires frequent coordination with the effort of others. 1 2 3 4 5

Task mobility

- a. I spend more time outside of company than office. 1 2 3 4 5
- b. My job is uninhibited for space. 1 2 3 4 5
- c. I have to move frequently to my job. 1 2 3 4 5
- d. I work at various locations. 1 2 3 4 5
- e. I have the freedom of choosing a place to perform my work. 1 2 3 4 5

Time criticality

- a. My work task requires to be performed promptly. 1 2 3 4 5
- b. My work often requires to react towards changes promptly. 1 2 3 4 5
- c. My work often required to deal with emergency cases. 1 2 3 4 5
- d. Time is extremely important for my work task. 1 2 3 4 5

Organizational norm

- a. In my organization, it is normal for people to use smartphones at work. 1 2 3 4 5
- b. In my organizations, I often see others using smartphones at work. 1 2 3 4 5
- c. In my organization, everyone avoids using smartphone at work. 1 2 3 4 5
- d. In my organizations, using smartphones for day to day working practice is a popular trend. 1 2 3 4 5

Managerial Support

- a. I am convinced that management is sure of the benefits that can be achieved with the smartphone 1 2 3 4 5
- b. I am always supported and encouraged by my boss to use the smartphones in my job. 1 2 3 4 5

Psychological Factors

8. Please **circle** the answer to the following statements which can best describe **how you feel towards yourself**.

Scale:	1= <i>Strongly Disagree</i>	2= <i>Disagree</i>	3= <i>Neutral</i>
	4= <i>Agree</i>	5= <i>Strongly Agree</i>	

Smartphone Self-efficacy

- | | | | | | |
|--|---|---|---|---|---|
| a. Interacting with smartphone does not require me a lot of mental effort. | 1 | 2 | 3 | 4 | 5 |
| b. I find smartphone is easy to use. | 1 | 2 | 3 | 4 | 5 |
| c. I find it is easy to get smartphone to do what I want to do. | 1 | 2 | 3 | 4 | 5 |

Conscientiousness

- | | | | | | |
|---|---|---|---|---|---|
| a. I see myself as someone who is reliable. | 1 | 2 | 3 | 4 | 5 |
| b. I see myself as someone who perseveres until the task is finished. | 1 | 2 | 3 | 4 | 5 |
| c. I see myself as someone who is responsible for the job. | 1 | 2 | 3 | 4 | 5 |
| d. I see myself as someone who does a thorough job. | 1 | 2 | 3 | 4 | 5 |
| e. I see myself as someone who is self-disciplined. | 1 | 2 | 3 | 4 | 5 |

SECTION IV – CONSEQUENCES

Job Performance

9. Please **circle** the answer to the following statements which can best describe your job performance.

Scale:	1= <i>Strongly Disagree</i>	2= <i>Disagree</i>	3= <i>Neutral</i>
	4= <i>Agree</i>	5= <i>Strongly Agree</i>	

- | | | | | | |
|---|---|---|---|---|---|
| a. I am currently working at my best performance level. | 1 | 2 | 3 | 4 | 5 |
| b. I try to be at work as often as I can. | 1 | 2 | 3 | 4 | 5 |
| c. I am one of the best at the work I do. | 1 | 2 | 3 | 4 | 5 |
| d. I set very high standards for my work. | 1 | 2 | 3 | 4 | 5 |
| e. My work is always of high quality. | 1 | 2 | 3 | 4 | 5 |
| f. I am proud of my work performance. | 1 | 2 | 3 | 4 | 5 |

Workplace Social Capital

10. Please **circle** the answer to the following statements which can best describe your social capital.

Scale:	1= <i>Strongly Disagree</i>	2= <i>Disagree</i>	3= <i>Neutral</i>		
	4= <i>Agree</i>	5= <i>Strongly Agree</i>			

- | | | | | | |
|---|---|---|---|---|---|
| a. I am not very close to my organizational colleagues | 1 | 2 | 3 | 4 | 5 |
| b. I have a very good relationship with my organizational colleagues. | 1 | 2 | 3 | 4 | 5 |
| c. I do not spend a lot of time interacting with employees in the organization. | 1 | 2 | 3 | 4 | 5 |
| d. I don't trust that my organizational colleagues are worthy to rely on | 1 | 2 | 3 | 4 | 5 |
| e. I know my organizational members will try to help me when I get into difficulties. | 1 | 2 | 3 | 4 | 5 |
| f. My organizational colleagues think that I am a reliable partner. | 1 | 2 | 3 | 4 | 5 |
| g. There is considerable consensus among my organizational colleagues about what is important at work. | 1 | 2 | 3 | 4 | 5 |
| h. My organizational colleagues are not enthusiastic about achieving goals and missions of the organization | 1 | 2 | 3 | 4 | 5 |
| i. My organizational colleagues and I always share the same ambitions and goals at work. | 1 | 2 | 3 | 4 | 5 |

Smartphone Addiction Symptom

11. Please **circle** the answer to the following statements which can best describe how you feel towards Smartphone using.

Scale:	1= <i>Not at all</i>	2= <i>Rarely</i>	3= <i>Occasionally</i>	4= <i>Often</i>	5= <i>Always</i>
--------	----------------------	------------------	------------------------	-----------------	------------------

- | | | | | | |
|---|---|---|---|---|---|
| a. You find it difficult to switch off your Smartphone. | 1 | 2 | 3 | 4 | 5 |
| b. You feel anxious if you have not checked for messages or switched on your Smartphone for some time. | 1 | 2 | 3 | 4 | 5 |
| c. You feel panic or unsettling if you forgot to bring the phone. | 1 | 2 | 3 | 4 | 5 |
| d. You feel anxious if your Smartphone were out of battery. | 1 | 2 | 3 | 4 | 5 |
| e. When Smartphone out of range for some time, you become preoccupied with the thought of missing a call. | 1 | 2 | 3 | 4 | 5 |

f. When you are unable to use Smartphone, you miss it so much.	1	2	3	4	5
g. You check the Smartphone status very frequently throughout the daily activities.	1	2	3	4	5
h. You have been told that you spend too much time on your Smartphone.	1	2	3	4	5
i. You find yourself engaged on the Smartphone for longer period of time than intended.	1	2	3	4	5
j. Your friends and family complain about your Smartphone use.	1	2	3	4	5
k. You can never spend enough time on your Smartphone when you use it.	1	2	3	4	5

SECTION V – DEMOGRAPHICS

Please *select* the appropriate responses for the questions below.

12. What's your Gender?

- Male
- Female

13. What's your Age? (as of December 28th, 2015):

14. What's your highest degree obtained?

- Below Bachelor's degree
- Bachelor's degree
- Master's degree
- Doctoral degree

15. What's your Marital Status?

- Unmarried
- Married

16. What's your monthly Salary?

- Below \$2,000 (include 2000)
- \$2,000-\$4,000 (include 4000)
- \$4,000-\$6000 (include 6000)
- \$6,000-\$8000 (include 8000)
- \$8,000-\$10000 (include 10000)
- \$10,000 and above

17. What's your job Occupation?

- Executive workers
- IT technicians
- Teachers & researchers
- Healthcare workers (i.e., doctors & nurses)
- Salespersons & marketing workers
- Media workers
- Others

18. What is the size of your organization (or company)?

- 0-10 employees
- 11-25 employees
- 26-50 employees
- 51-75 employees
- 76-100 employees
- 101-200 employees
- Above 201 employees

19. What's your Job position?

- Junior staff workers
- Senior staff worker
- Lower-level managers
- Middle-level managers
- Senior-level managers

20. How many years have you been working?

- Below 2 years
- 2-4 years (include 2 years)
- 4-6 years (include 4 years)
- 6-8 years (include 6 years)
- 8-10 years (include 8 years)
- Over 10 years (include 10 years)

21. What's your Current Location (city of working)?

Thank you for your participating in this web survey.

If you provided full valid responses, we will contact you via WeChat within three days for giving the 30RMB as the token of appreciation.

Please leave **Your WeChat ID** here: _____

If you have queries, please contact the investigator (Li Li) at the following address:

Li Li

PhD Candidate in Communication

Wee Kim Wee School of Communication and Information

Nanyang Technological University, Singapore

Tel: 65-67906971

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Appendix G

Survey Questionnaire (Chinese Version)

调查问卷

第一部分：智能手机使用

1. 您的手机是智能手机吗？
 - 是
 - 否

2. 您使用智能手机多长时间了？（从您开始用第一部智能手机算起）
 - 不足1年(包括1年)；
 - 1年到3年（包括3年）；
 - 3年到5年（包括5年）；
 - 5年到7年（包括7年）；
 - 超过7年

3. 您目前使用的是哪种智能手机？
 - 三星
 - 苹果
 - 小米
 - 华为
 - 其它

4. 平均下来，您每天因为工作的原因使用手机多长时间？
 - 少于一个小时
 - 一个小时到两个小时（包括一个小时）
 - 两个小时到三个小时（包括两个小时）
 - 三个小时到四个小时（包括三个小时）
 - 多于四个小时（包括四小时）

5. 以下是一些关于在工作中对不同手机功能使用频率的提问，请选择与您意见最接近的答案。

量度： 1= 从不 2= 很少 3=偶尔 4=还算频繁 5= 十分频繁

a. 出于工作的目的，您通过手机给他人 <u>打电话</u> 的频率是？	1	2	3	4	5
b. 出于工作的目的，您通过手机给他人 <u>发送短信</u> 的频率是？	1	2	3	4	5
c. 您通过手机 <u>查收/发送工作相关的邮件</u> 的频率是？	1	2	3	4	5
d. 您通过手机浏览器 <u>搜索/查询工作相关信息</u> 的频率是？	1	2	3	4	5
e. 出于工作的目的，您使用手机 <u>微博</u> 的频率是？	1	2	3	4	5
f. 出于工作的目的，您使用手机 <u>及时通讯工具</u> （例如，手机 QQ，微信）的频率是？	1	2	3	4	5

第二部分 - 在工作中的智能手机依赖

6. 以下是一些关于手机能多大程度上帮助您工作的描述，请选择与您意见最接近的答案。

量度： 1= 一点也没帮助 2= 很小帮助 3=偶尔有帮助
4=常常有帮助 5=极其有帮助

在您的工作中，手机能多大程度上帮助您：

Understanding

a. 随时知晓工作单位上发生了什么。	1	2	3	4	5
b. 弄清楚工作相关的事宜。	1	2	3	4	5
c. 了解工作相关事件的进度。	1	2	3	4	5

Orientation

g. 收集工作相关的资料。	1	2	3	4	5
h. 编写工作相关的文档。	1	2	3	4	5
i. 记录工作相关的信息。	1	2	3	4	5
j. 引导在工作中的行为。	1	2	3	4	5

Communication

d. 和他人讨论工作相关的事情。	1	2	3	4	5
e. 和同事，客户保持联系。	1	2	3	4	5
f. 和同事，客户互动。	1	2	3	4	5

第三部分 - 诱发因子

Task Attributes & Organizational Norm

7. 以下是一些关于您工作性质的描述，请选择与您意见最接近的答案。

量度: 1= 非常不同意 2= 不同意 3=不确定 4=同意 5= 非常同意

Task interdependence

- | | | | | | |
|-------------------------------|---|---|---|---|---|
| a. 我的工作是可以独立完成的。 | 1 | 2 | 3 | 4 | 5 |
| b. 我的工作并不需要和他人配合。 | 1 | 2 | 3 | 4 | 5 |
| c. 我很少需要通过得到别人的信息来完成工作。 | 1 | 2 | 3 | 4 | 5 |
| d. 其他同事或者其他部门的工作表现基本不会影响我的工作。 | 1 | 2 | 3 | 4 | 5 |
| e. 我的工作需要经常和他人协作。 | 1 | 2 | 3 | 4 | 5 |

Task mobility

- | | | | | | |
|--------------------------|---|---|---|---|---|
| a. 我大多数工作时间都在公司/单位外面跑。 | 1 | 2 | 3 | 4 | 5 |
| b. 我的工作并没有地点的限制，哪里都可以进行。 | 1 | 2 | 3 | 4 | 5 |
| c. 我的工作地点经常在移动。 | 1 | 2 | 3 | 4 | 5 |
| d. 我在不同的地点上班。 | 1 | 2 | 3 | 4 | 5 |
| e. 我可以自由的选择在哪里进行工作。 | 1 | 2 | 3 | 4 | 5 |

Time criticality

- | | | | | | |
|------------------------|---|---|---|---|---|
| a. 我的工作任务通常需要立即执行。 | 1 | 2 | 3 | 4 | 5 |
| b. 我的工作经常需要对变化做出及时的反应。 | 1 | 2 | 3 | 4 | 5 |
| c. 我的工作经常需要处理一些紧急情况。 | 1 | 2 | 3 | 4 | 5 |
| d. 时效性对我的工作来说极其重要。 | 1 | 2 | 3 | 4 | 5 |
| e. 我的工作可以在任何时间点来做。 | 1 | 2 | 3 | 4 | 5 |

Organizational norm

- | | | | | | |
|-------------------------------------|---|---|---|---|---|
| a. 在我的工作单位，大家在工作中使用手机非常正常的。 | 1 | 2 | 3 | 4 | 5 |
| b. 在我的工作单位，我经常看到其他人在工作中使用手机。 | 1 | 2 | 3 | 4 | 5 |
| c. 在我的工作单位，每一个人在工作中都尽量避免使用手机。 | 1 | 2 | 3 | 4 | 5 |
| d. 在我的工作单位，通过手机来进行日常的工作处理是一种受欢迎的趋势。 | 1 | 2 | 3 | 4 | 5 |

Managerial Support

- a. 我坚信我们公司管理层深知智能手机能带来好处。 1 2 3 4 5
- b. 我的领导很支持和鼓励我们在工作中使用手机。 1 2 3 4 5

Psychological Factors

8. 以下是一些关于您个人性格特质的描述，请选择与您意见最接近的答案。

量度: 1= 非常不同意 2= 不同意 3=不确定 4=同意 5= 非常同意

Self-efficacy

- a. 使用手机时并不需要我花费我大量的脑力。 1 2 3 4 5
- b. 我觉得手机的使用很简单。 1 2 3 4 5
- c. 我可以很轻松的让手机去做我想让它做的事。 1 2 3 4 5

Conscientiousness

- a. 我觉得我是一个可靠的人。 1 2 3 4 5
- b. 我觉得我是一个坚持不懈，直至达成目标的人。 1 2 3 4 5
- c. 我觉得我是一个对工作认真负责的人。 1 2 3 4 5
- d. 我觉得我是一个做事十分周密的人。 1 2 3 4 5
- e. 我觉得我是一个对自己有严格要求的人。 1 2 3 4 5
- f. 我很害怕受到批评。 1 2 3 4 5

第四部分 - 影响

Job Performance

9. 以下是一些关于工作表现的描述，请选择与您意见最接近的答案。

量度: 1= 非常不同意 2= 不同意 3=不确定 4=同意 5= 非常同意

- a. 我现在的工作表现是有史以来最好的。 1 2 3 4 5
- d. 我试着在工作中尽我所能。 1 2 3 4 5
- e. 在我的工作岗位上，我是最优秀的员工之一。 1 2 3 4 5

- | | | | | | |
|--------------------|---|---|---|---|---|
| g. 我给我的工作设定了很高的标准。 | 1 | 2 | 3 | 4 | 5 |
| h. 我的工作一直都高质量完成。 | 1 | 2 | 3 | 4 | 5 |
| i. 我对我的工作表现感到很自豪。 | 1 | 2 | 3 | 4 | 5 |

Workplace Social Capital

10. 以下是一些关于您**和同事关系**的描述，请选择与您意见最接近的答案。

量度: 1= 非常不同意 2= 不同意 3=不确定 4=同意 5= 非常同意
--

- | | | | | | |
|----------------------------------|---|---|---|---|---|
| a. 我和单位的同事并不亲近。 | 1 | 2 | 3 | 4 | 5 |
| b. 我和单位同事关系很好。 | 1 | 2 | 3 | 4 | 5 |
| c. 我并不会花很多时间和单位同事交流。 | 1 | 2 | 3 | 4 | 5 |
| d. 我并不认为我单位的同事是可以信赖的。 | 1 | 2 | 3 | 4 | 5 |
| e. 当我有困难的时候，我知道我的同事会尽力帮助我。 | 1 | 2 | 3 | 4 | 5 |
| f. 我的同事认为我是一个可依赖的合作伙伴。 | 1 | 2 | 3 | 4 | 5 |
| g. 对于在工作中什么最重要，我们单位全体员工都有相当大的共识。 | 1 | 2 | 3 | 4 | 5 |
| h. 我们单位的同事并不热衷于实现单位的目标和使命。 | 1 | 2 | 3 | 4 | 5 |
| i. 我和公司同事拥有共同的抱负和目标。 | 1 | 2 | 3 | 4 | 5 |

Smartphone Addiction Symptom

11. 以下是一些关于对**手机使用感受**的描述，请选择与您意见最接近的答案。

量度: 1= 从不 2= 很少 3=偶尔 4=经常 5= 总是

- | | | | | | |
|----------------------------------|---|---|---|---|---|
| a. 让你关掉手机，你感到很难。 | 1 | 2 | 3 | 4 | 5 |
| b. 当你一段时间没有打开手机或查看手机信息，你感到很焦虑。 | 1 | 2 | 3 | 4 | 5 |
| c. 当你忘记带手机，你会感到很惊慌不安。 | 1 | 2 | 3 | 4 | 5 |
| d. 当你的手机没电的时候，你会感到很着急。 | 1 | 2 | 3 | 4 | 5 |
| e. 当你的手机不在身边一段时间，你满脑子都在担心错过重要电话。 | 1 | 2 | 3 | 4 | 5 |
| f. 当你不能用手机的时候，你会非常想它。 | 1 | 2 | 3 | 4 | 5 |
| g. 在你的日常生活工作中，你频繁的查看你的手机状态。 | 1 | 2 | 3 | 4 | 5 |

- | | | | | | |
|--------------------------|---|---|---|---|---|
| h. 你经常听到别人说你在手机上花费的时间太多。 | 1 | 2 | 3 | 4 | 5 |
| i. 你在手机上花费的时间常常超过你的预期。 | 1 | 2 | 3 | 4 | 5 |
| j. 你的朋友和家人常常抱怨你的手机使用。 | 1 | 2 | 3 | 4 | 5 |
| k. 当你使用手机的时候，总觉得时间不够。 | 1 | 2 | 3 | 4 | 5 |

第五部分 - 个人信息

12. 请问您的性别是？

- 男性
- 女性

13. 请问您的年龄是（截止到 2015 年 12 月 28 日）：

14. 请问您获得的最高学历是？

- 大学本科以下学历
- 大学本科
- 硕士研究生
- 博士研究生

15. 请问您的婚姻状况是？

- 未婚
- 已婚

16. 请问您的每月工资收入是？

- 低于 2000 元（包括 2000 元）
- 2000 到 4000 元（包括 4000 元）
- 4000 到 6000 元（包括 6000 元）
- 6000 到 8000 元（包括 8000 元）
- 8000 到 10000 元（包括 10000 元）
- 超过 10000 元

17. 请问您主要是做什么工作的？

- 行政管理人员
- IT 技术人员
- 教师或科研人员
- 医疗工作者（例如医生，护士）

- 销售人员或市场营销人员
- 媒体工作者
- 其它

18. 您公司/单位的规模是？

- 有 0-10 个员工
- 有 11-25 员工
- 有 26 - 50 员工
- 有 51-75 员工
- 有 76-100 员工
- 有 101-200 员工
- 有超过 201 员工

19. 在单位，请问您属于什么级别的员工？

- 初级员工
- 中级员工
- 初级管理层
- 中层管理者
- 高层管理者

20. 请问您踏入工作几年了？（从您正式开始工作算起）

- 少于 2 年
- 2 年到 4 年（包括 2 年）
- 4 年到 6 年（包括 4 年）
- 6 年到 8 年（包括 6 年）
- 8 年到 10 年（包括 8 年）
- 超过 10 年（包括 10 年）

21. 请问您目前工作的城市是？-----

非常感谢您参与本次问卷。

如果您提供的信息有效，我们会在三天之内通过微信联系您，给您发送 30 元的微信红包 以表感谢。

请在此留下您的微信号：

如果您有任何问题或疑问，请通过以下地址联系本次研究的负责人黎黎。

黎黎

传播学博士研究生

新加坡南洋理工大学黄金辉传播与信息学院

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邮箱：lili0026@e.ntu.edu.sg

Appendix H

Consent Form

Survey for Work-related Smartphone Dependency among Young Working Adults in China

Dear Participant,

We want to thank you for taking the time to participate this survey. We are conducting this survey as part of a PhD thesis on examining young Chinese working adults' work-related smartphone dependency, specifically its dependency relation, antecedents and impacts.

Hence, if you are a **full-time working adult in mainland China, aged from 18 to 35, have used Smartphone for work-related purposes**, you will be our target participant. If you are not meet the above criteria, please ignore this survey.

The survey will take you 20 to 30 minutes to complete. All data you provide will be kept confidential and only used for academic purposes. Results of this study may be presented at conferences and/or published in books, journals, etc. for research purposes. However, we will ensure that respondents' identifies will be kept confidential.

Remember, your participation in this study is completely voluntary, and you may withdraw from the survey at any time without penalty. Your decision to participate, decline, or withdraw participation will have no effect on your status. Once you provided full valid responses towards the survey questions, you will receive a \$6 (30 RMB) "WeChat Red Envelop" (*Chinese: 微信红包*) as a token of appreciation.

Thanks a lot for your participation! If you have questions about this study, please feel free to contact Li Li or her supervisor Dr. Trisha T. C. Lin or at the following address.

Li Li

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Note: If you have any concerns about this study or your experience as a participant, you may contact the Institutional Review Board (IRB) at NTU at 65-65922495 (collect calls will be accepted if you state you are a study participant); email: irb@ntu.edu.sg.

I have read the above information and give my consent to participate in this study.

- Yes
- No

Appendix I

Consent Form (Chinese Version)

知情同意书

中国年轻人在工作中对智能手机依赖情况之问卷调查

亲爱的受访者，

您好！

谢谢您在百忙之中腾出时间来参与这次问卷调查。这次问卷作为黎黎博士论文的一部分，旨在调查中国年轻人在工作方面对智能手机的依赖情况，特别是依赖的特征，成因和影响。

如果您的**年龄在18-34岁之间，有全职的工作，使用智能手机联系处理过工作相关的事情**，您将是我们期待的目标受访者。如果您不符合以上的条件，请忽略此次问卷。

本次问卷将会花费您20到30分钟的时间。您的所有回答都将会保密且仅为学术研究所用。本次研究的成果可能会发表于相关的会议，杂志或书刊上。但我们会确保隐藏您的所有个人信息。

您的参与是完全自愿的，并且可以随时终止或退出本次问卷调查。您是否参与或退出本次问卷调查并不会对你的工作生活造成任何影响。当您完成了本次问卷且提供了有效的答案，您将会收到三十元的微信红包以表示我们对您的感谢。

我们由衷的感谢您的参与！如果您有任何关于本次研究的问题或疑惑，请随时通过以下地址和黎黎或她的导师 Dr. Trisha T. C. Lin联系。

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注意：本次研究已经通过了南洋理工大学机构审查委员会的批准，如果您对此研究或作为调查参与者的权益有任何问题，欢迎随时和新加坡南洋理工大学机构审查委员会联系：65-65922495，邮件：irb@ntu.edu.sg

我已经阅读了上述信息并同意参加这次问卷调查。

- 是
- 否

Appendix J

Approval Letter of IRB (Survey Study)



Research Support Office

Reg. No. 200604393R

IRB-2015-10-004

04 November 2015

Assistant Professor Lin Tsui-Chuan, Trisha
Wee Kim Wee School of Communication and Information

NTU INSTITUTIONAL REVIEW BOARD APPROVAL

Project Title: Examine work-related mobile phone dependency among young working adults in China: a survey approach

I refer to your application for ethics approval with respect to the above project.

The Board has deliberated on your application and noted from your application that your research involves collecting behavioral data from participants using surveys.

You have also confirmed that informed consent will be obtained from the participants and you have guaranteed the confidentiality of your participants' biodata obtained from them.

The documents reviewed are:

- a) NTU IRB application form dated **01 October 2015**
- b) Participant information sheet and consent form: version 1 dated **01 October 2015**
- c) Data collection form: version 1 dated **01 October 2015**

The Board is therefore satisfied with the bioethical consideration for the project and approves the ethics application under **Expedited** review. The approval period is from **04 Novemebr 2015** to **25 Novemebr 2016**. The NTU IRB reference number for this study is **IRB-2015-10-004**. Please use this reference number for all future correspondence.

The following protocol and compliances are to be observed upon NTU IRB approval

1. All research involving procedures greater than minimal risk on minors (individuals who are less than the legal age of 21 years old) requires IRB approved written Parental Consent and assent from the participant to be obtained before any research protocols can be administered. Minimal risk refers to an anticipated level of harm and discomfort that is no greater than that ordinarily encountered in daily life, or during the performance of routine educational, physical, or psychological examination.
2. Only the approved Participants Information Sheet and Consent Form should be used. It must be signed by each subject prior to initiation of any protocol procedures. In addition, each subject should be given a copy of the signed consent form.

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www.ntu.edu.sg



Research Support Office

3. Consent forms are important documents therefore they should be stored in the strictest arrangement. Loss of consent form would result in disciplinary action.
4. No deviation from, or changes of, the protocol should be initiated without prior written NTU IRB approval of an appropriate amendment.
5. The Principal Investigator should report promptly to NTU IRB regarding:
 - a. Deviation from, or changes to the protocol.
 - b. Changes increasing the risk to the subjects and/or affecting significantly the conduct of the trial
 - c. All serious adverse events (SAEs) which are both serious and unexpected.
 - d. New information that may affect adversely the safety of the subjects of the conduct of the trial.
 - e. Completion of the study.
6. Continuing Review Request/ Notice of Study completion form should be submitted to NTU IRB for the following:
 - a. Annual review: Status of the study should be reported to the NTU IRB at least annually using the Continuing Review Request/ Notice of Study completion form.
 - b. Study completion or termination: Continuing Review Request/ Notice of Study completion form is to be submitted within 4 to 6 weeks of study completion or termination.
7. All Principal Investigators should comply with existing legislation that would have an impact on the domain of their research.

A handwritten signature in black ink, appearing to read "Lee Sing Kong".

Professor Lee Sing Kong,
Chair, NTU Institutional Review Board
encl.

cc Chair, Wee Kim Wee School of Communication and Information
Members, NTU Institutional Review Board

PUBLICATIONS

The following lists the Journal papers and conference papers I have published or presented in the past four years as a Doctoral student:

Journal Paper

Lin, T. T. C., **Li, L.*** & Bautista, J. R. R. (in press). Examining how communication and knowledge relate to Singaporean youth's perceived risk of haze and intentions to take preventive behaviors. *Health Communication*. [SSCI/Corresponding Author]
<Online first:

<http://www.tandfonline.com/doi/full/10.1080/10410236.2016.1172288> >

Li, L., & Lin, T. T. C. (2016). Exploring work-related smartphone dependency among young working adults in China: A qualitative approach. *International Journal of Communication*. 10, 2915-2933. [SSCI]

Li, L., & Lin, T. T. C. (2016). Examining Weibo posting anxiety among well-educated youth in China: A qualitative approach. *Information Development*, 32(4), 1240-1252. [SSCI]

Yang, X., & **Li, L.** (2016). Will the spiral of silence spin on Social Networking Sites? An experiment on opinion climate, fear of isolation and outspokenness. *China Media Research*, 12(1), 65-76.

Chitra, P. K., **Li, L.**, & Ho, S. S. (2014). Examining how communication and demographic factors relate to attitudes toward legalization of same-sex marriage in Singapore. *International Journal of Public Opinion Research*, 26(3), 355-368. [SSCI]

Lin, T. T. C., & **Li, L.** (2014). Perceived characteristics, perceived popularity, and playfulness: Youth adoption of Mobile Instant Messaging in China. *China Media Research*, 10 (2), 60-71.

Conference Paper

Li, L. & Lin, T. T. C. (2017, May). *Work-related smartphone dependency among young workers in China: An examination of dependency relations and antecedents. (Survey study)* Paper is accepted for presentation at 2017 annual conference of International Communication Association (ICA), San Diego, CA.

Li, L. & Lin, T. T. C. (2016, August). *Exploring the roles of social anxiety, self-efficacy, and job stress on Chinese workers' smartphone addiction.* Paper presented at the annual meeting of the Association for Education in Journalism and Mass Communication (AEJMC), Minneapolis, MN.

Li, L. (2016, July). *A qualitative exploration of smartphone dependency at work: dependency relations and antecedents. (interview study)* Paper presented at 2016 International Association for Media and Communication Research (IAMCR) Annual Conference, Leister, UK.

Li, L. (2015, May). *Examining the predictors and impacts of mobile phone dependency.* Paper presented at the annual conference of International Communication Association (ICA), San Juan, Puerto Rico.

- Lin, T. T. C., **Li, L.**, Liang Z. & Chiang, Y. (2014, October). *Understanding symptoms and impacts of smartphone dependency among adolescents in Singapore*. Paper presented at 2014 International Communication Association (ICA) Brisbane Regional Conference, Brisbane, Australia.
- Li, L.** (2014, October). *Proposing a hybrid model for mobile phone dependency within three influential communication-related theories*. Paper presented at 2014 International Communication Association (ICA) Brisbane Regional Conference, Brisbane, Australia.
- Li, L.**, & Lin, T. T. C. (2014, August). *Investigating Weibo posting anxiety among well-educated youths in China*. Paper presented at the annual meeting of the Association for Education in Journalism and Mass Communication (AEJMC), Montreal, Canada.
- Lin, T. T. C. & **Li, L.** (2013, November). *Youth Adoption of Mobile Instant Messaging in China*. Paper presented at International Communication Association (ICA) Shanghai Regional Conference, Shanghai, China.
- Chitra, P. K., **Li, L.**, & Ho, S. S. (2013, August). *News attention and demographic factors affecting attitudes towards legalization of same-sex marriage in Singapore*. Paper presented at the annual meeting of the Association for Education in Journalism and Mass Communication (AEJMC), Washington, DC.