International Journal of Communication 10(2016), 2915–2933 1932–8036/20160005

Exploring Work-Related Smartphone Dependency Among Young Working Adults in China: A Qualitative Approach

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This study extends the application of media system dependency theory to explore the work-related dependency relations of young working adults with their smartphones and the antecedents of such smartphone dependency. By conducting semistructured interviews with 32 young employees in China, this study showed that Chinese young workers mainly depend on their smartphones for understanding (e.g., being updated of the events in their work), orientation (e.g., performing work-related actions), and communication (e.g., contacting and interacting with colleagues) at work. Three task attributes (i.e., task interdependence, task mobility, and time criticality) and organizational norms influence the work-related smartphone dependency of Chinese young workers. Implications for theories and practices are discussed.

Keywords: smartphone dependency, young working adults, dependency relations, task characteristics, organizational norms

People use smartphones for day-to-day working practices in a variety of companies and organizations. The latest survey of Good Technology shows that more than 132 million people use their smartphones at work, and this number is expected to skyrocket to 328 million by 2017 (Fried, 2014). Previous studies have shown the various benefits of using smartphones for work, such as instant, on-the-go access to e-mail and websites, round-the-clock connection with colleagues and clients, work schedule management and document editing applications, rapid responses to time-critical events, and unshackling workers from their office desks (e.g., Collins, Cox, & Wootton, 2015; Kossek & Lautsch, 2012; Lanaj, Johnson, & Barnes, 2014; Perlow, 2012).

Because of their unprecedented benefits, employees have become increasingly dependent on their smartphones. According to Forrester's survey of more than 5,500 smartphone users in North America and Europe, at least 50% of smartphone-equipped workers have become dependent on such gadgets in performing their jobs (Murphy, 2011). Another survey by the Center for Creative Leadership revealed that

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Date submitted: 2015–11–24

[1] This work was supported by Nanyang Technological University Research Grant M4081477.060.
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the majority of the workers in the United States use their smartphones to stay connected with their work 24/7, whereas nearly 60% use smartphones to keep in touch with their work 13.5 hours every weekday and five hours every weekend to read their work e-mails (Deal, 2013). The smartphone dependency phenomenon also prevails among working adults in some developing countries with a low smartphone penetration rate. A survey by Alliance ("Survey for White-Collar Worker," 2013) revealed that approximately 80% of 10,233 randomly selected Chinese white-collar workers have high dependence on their smartphones; such a level of dependence is reflected by the fact that these workers take their smartphones with them everywhere, keep their phones turned on 24/7, and cannot work efficiently without them.

Although many scholars have paid attention to the topic of smartphone dependency, a majority of them have studied it as a similar concept as smartphone addiction or problematic smartphone use (e.g., Park, Kim, Shon, & Shim, 2013; Salehan & Negahban, 2013). Unlike previous research, this study examined smartphone dependency as a neutral concept, which refers to a relationship reflecting users' reliance on their smartphones to attain goals. Moreover, only a few studies have investigated smartphone dependency in the work domain as most of existing studies have focused mainly on adolescents or university students (e.g., Lin, Li, Chiang, & Liang, 2014; Park et al., 2013). To fill the research gaps, this study used media system dependency (MSD) theory (Ball-Rokeach & DeFleur, 1976) as the theoretical underpinning to explore smartphone dependency at work. In particular, by interviewing young employees in China, we aimed to answer two questions: (1) What are the work-related dependency relations that young Chinese working adults have developed with their smartphones? (2) What are the antecedents that influence their work-related smartphone dependency?

Theoretically, this pioneering research provides novel knowledge to understand smartphone dependency in the work domain. Moreover, by using MSD theory as the theoretical framework, this study examined how existing theories, which are largely developed in traditional media environments (Ball-Rokeach, 1998), are useful in understanding and explaining smartphone dependency and its origins. In practice, this study can help employers and companies understand how and why their workers are dependent on smartphones at work so as to develop management strategies. Given that heavy dependency on smartphones at work may lead to several problems, such as increased job stress (Derks & Bakker, 2014), our findings can help organizations detect those workers who are likely to become overly dependent on their smartphones and provide them with timely guidance at early stages of problems.

Smartphone Dependency

Over the past few years, a growing number of studies have investigated the topic of smartphone dependency (e.g., Ahn, Jun, & Kim, 2015; Chen, Chen, & Lee, 2015; Harun, Soon, Kassim, & Sulong, 2015; Lin, Chiang, & Jiang, 2015; Lin et al., 2014; Park et al., 2013; Suki & Suki, 2013; Ting, Lim, Patanmacia, Low, & Ker, 2011). However, the term *smartphone dependency* remains unclear and lacks a consistent and clear conceptualization. Lin et al. (2015) defined smartphone dependency as a relationship in which individuals achieve their goals by relying on the mobile activities via smartphones. Park et al. (2013) conceptualized smartphone dependency as a behavioral and psychological consequence of smartphone usage. Ting et al. (2011) regarded smartphone dependency as a similar term to *smartphone*

usage. In this study, the conceptualization of smartphone dependency is rooted in MSD theory, a classic communication theory. Introduced by Ball-Rokeach and DeFleur (1976), MSD theory defines dependency as "a relationship in which the satisfaction of needs or attainment of goals by one party is contingent upon the resources of another party" (p. 6). In this vein, smartphone dependency can be defined as a relationship that reflects the reliance of users on their smartphones to achieve goals. Unlike smartphone addiction, which emphasizes problematic smartphone use (e.g., Bian & Leung, 2015; Salehan & Negahban, 2013), smartphone dependency in this study is based on various levels of smartphone use and is related to attaining work-related goals and solving work-related problems.

MSD Theory and Smartphone Dependency

MSD theory is grounded in the classical sociological literature by positing that media and their audiences must be studied in the context of larger social systems (Ball-Rokeach & DeFleur, 1976). Media dependency is manifested at the macro and micro levels (Ball-Rokeach, 1998; Ball-Rokeach & DeFleur, 1976; DeFleur & Ball-Rokeach, 1989). The macro level deals with media systems and their goals and resources, whereas the micro level (individual level) focuses on the individual and his or her goals and resources. This study emphasized the individual-level analysis of smartphone dependency, which examined how young employees depend on their smartphones to access, process, and disseminate work-related resources and attain their work-related goals.

Dependency Relations

MSD theory posits that individuals develop dependency relationships with the media because individuals are goal-directed and some of their goals can be achieved by accessing media-controlled resources (DeFleur & Ball-Rokeach, 1989). Ball-Rokeach (1985) categorized individuals' media dependency relations into three general types according to their goals, namely, understanding (people rely on mass media to understand themselves and their societies), orientation (individuals depend on mass media to guide their behaviors and take actions), and play (people rely on mass media to entertain themselves or escape from reality). Ball-Rokeach argued that these dependency relations are exhaustive yet not mutually exclusive because some media might serve more than one type of dependency. However, it is worth noting that these individual–media dependency relations were developed from the traditional mass media system and based on the assumption that individuals depend on the media to provide information about their social environment (Ball-Rokeach, 1998). When it comes to the new media environment in which new media technologies, such as smartphones, empower people with the ability to communicate, create, gather, and disseminate the information, the media dependency relations of individuals should be extended. Moreover, these original goal-related media dependency relations, which are primarily developed for general life settings, may not be fully applied to a specific working context. Therefore, the first key objective of the current study was to extend MSD theory to explore the work-related dependency relations that young Chinese working adults develop with their smartphones.

Antecedents

MSD theory also discusses the origins of individuals' media dependency. In contrast to traditional psychological or social psychological approaches for analyzing the determinants of media dependency, MSD theory offers a sociological approach for investigating how people become dependent on the media (Ball-Rokeach, 1985). The theory posits that the intensity of individual media dependency is determined more by the social structural environment than by personal psychological attributes. In particular, two conditions in the social environment are likely to influence the degree of individuals' media dependency, namely, (a) the ambiguity and degree of threat present in their social environments and (b) the activities of interpersonal networks (Ball-Rokeach, 1985). Ball-Rokeach (1985) argued that most people would experience heightened dependency on the information resources of the media when the salient aspects of their environment are ambiguous (i.e., insufficiently predictable or interpretable), especially when the media are perceived to be the "best" or "primary" information system available. The threats in the environment can also intensify the media dependency of individuals because people need to depend on the media to signal, interpret, and organize their responses to wars, crises, emergencies, and other potentially threatening situations. Therefore, individuals tend to experience a higher degree of media dependency when they are in ambiguous or threatening social environments. In the working context, different job features may lead to various environments, which may consequently result in varying levels of work-related smartphone dependency. For example, individuals may confront unpredictable situations if their work tasks can be accomplished only by depending on the efforts or information of others. Therefore, these individuals may grow dependent on their smartphones as tools for removing ambiguities at work. Similarly, individuals may encounter urgent cases when facing time-critical work tasks and then grow dependent on smartphones as tools for responding to such urgencies. Based on existing literature (e.g., Cherry, 2007; Staples & Jarvenpaa, 2000; Vinaja, 2013), we expected that three task characteristics (i.e., task interdependence, task mobility, and time criticality) could lead employees into ambiguous or threatening work environments. Task interdependence refers to the degree to which organizational employees depend on other members to accomplish their goals of the task (Sharma & Yetton, 2007). Task mobility reflects the extent to which a task is performed in different locations (Kakihara & Sorensen, 2002). Time criticality refers to the extent to which a task is time critical (Yuan, Archer, Connelly, & Zheng, 2010). This study explored how these task attributes are associated with the work-related smartphone dependency of young employees.

In addition, MSD theory posits that the activities of interpersonal networks affect individuals' media dependency (Ball-Rokeach, 1985). Given that an individual is situated in various interpersonal networks, his or her media use is shaped by the behavior of such networks (Ball-Rokeach, 1985). For example, when the communication focuses of interpersonal networks occur in one medium, individuals would tend to depend on such a medium to maintain effective and satisfying interpersonal relationships. In this vein, it is reasonable to expect that the organizational norm, which represents the unwritten rules that all members of an organization must follow in their work and interact with one another (Hammer, Saksvik, Nytrø, Torvatn, & Bayazit, 2004), will influence the smartphone dependency of employees at work.

Method

The objectives of this study were to obtain in-depth knowledge on the work-related smartphone dependency relations and their possible antecedents (e.g., task characteristics and organizational norm) among young working adults in China. The qualitative interview approach was employed to achieve these goals. Young working adults were selected as the target participants mainly because the number of young employees in China becoming highly dependent on their smartphones has been increasing ("Around 80 Percent," 2013; "Over Half," 2015; "Survey for White-Collar Worker," 2013). Thirty-two participants (17 men and 15 women), aged between 24 and 34 years (M = 28.09 years, SD = 2.79), were recruited using a snowball sampling method (see Table 1 for interviewee profiles). These participants were young employees working in various industrial sectors in Mainland China (e.g., IT, education, media, health care, telecommunications, finance, and manufacturing). All of the respondents considered smartphone an indispensable tool in their work. In addition to voice calls and short message service, the participants frequently used WeChat and mobile e-mail in their work.

Table 1. Interviewee Profiles.

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	Office administrator	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	Engineering	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 planner	Advertising	Shanghai

22	29	Male	Manager	Education	Xian
23	24	Female	Auditor	Accounting	Heilongjiang
24	28	Male	Editor	Media	Shanxi
25	26	Male	Doctor	Health care	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

Open-ended semistructured interviews were conducted in Chinese between February 2015 and March 2015. The data collection began after receiving approval from the Institutional Review Board of Nanyang Technological University. We initially invited the potential participants for face-to-face or Skype interviews through personal networks. Subsequently, these participants were asked to invite their colleagues to participate in the study. The interview guide provided a set of questions that were developed mostly on the basis of the research questions and related literature. These questions covered three key parts, namely, (1) work-related smartphone dependency relations, (2) their possible antecedents (e.g., task attributes and organizational norm), and (3) demographics. To better understand the smartphone dependency experiences of the participants, the interviews began with general questions (e.g., "Why do you become dependent on smartphones in your work?" and "How can smartphones help you in your work?") before moving to specific ones (e.g., "Do your job attributes make you become dependent on your smartphone in your work?" and "What are the unwritten rules of your company regarding smartphone use?"). During the interview processes, follow-up questions were asked in response to participants' answers. For consistency, all interviews were conducted by the same trained interviewer. Each interview lasted approximately 40 minutes and was recorded for further data analysis. The data collection was completed when no additional valuable understanding could be further generated from the interview, thereby indicating that theoretical saturation was achieved (Morgan, 1998). The point of saturation arrived at the 32nd interviewee. Those participants who successfully completed the interview were given US$7 as a token of appreciation.

The interview data were analyzed using the thematic analysis approach. In the first step, the audio recordings were transcribed verbatim by the researchers. Second, all transcripts were coded line-by-line using NVivo 10 software. Third, after comparing, cross-checking, and interrelating the codes, we determined several recurrent themes for analysis. Fourth, the results were analyzed in reference to the existing literature and the research goals. Last, the most revealing quotes were selected to illustrate the findings.

Results

Dependency Relations

Work-related smartphone dependency relations were categorized according to the goals of young workers in relation their smartphone use at work. The coding results demonstrated that understanding and orientation, as identified by Ball-Rokeach (1985), are the key dependency relations young employees developed with their smartphones at work. Communication was also identified as a new work-related smartphone dependency relation that indicates users' reliance on smartphones for communicating and interacting with their colleagues and clients.

Understanding. Relying on smartphones to understand work-related matters is the first key dependency relation that young employees developed with their smartphones. Twenty-two respondents reported that their smartphones considerably helped them stay on top of what was happening at work and keep up with recent work-related information. Respondent 1, a 34-year-old IT manager in a telecommunications company, stated, "All of our company's announcements or notifications were transmitted via short message service. Without smartphones, I would have no idea of what was happening at work." Another example comes from a young futures trader (Respondent 27) who synced her work mailbox with her smartphone. She stated, "If my company sent me an e-mail, especially when I am on my way to work or when I am on leave, my phone would send me alerts and I could check my e-mail immediately." Besides, some respondents demonstrated their reliance on smartphone applications to receive the latest work-related information. For example, Respondent 32, a 25-year-old female journalist, said,

> 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. These applications are very helpful for me.

Apart from keeping abreast with their work, five respondents considered their smartphones as alternatives to a personal computer and depended on them for work-related information seeking. "When I am checking my patients in their wards, there is no laptop around. Whenever I face some questions regarding medication, I would use my phone to search for related materials," a young orthopedics doctor (Respondent 25) stated. Similarly, Respondent 13, a 28-year-old female employee in the textile manufacturing industry, mentioned that she often relied on her smartphone after her shift to search for relevant information about the textile industry. She said, "My work requires me to keep updated with the fashion trends. Therefore, I frequently search for fashion-related information or pictures on my smartphone."

Orientation. Orientation is another work-related dependency relation that young employees have developed with their smartphones. The coding results revealed that orientation is mainly reflected in the dependence of young employees on their smartphones to perform work-related actions, such as

writing/editing work-related files, gathering materials, calculating data, and recording important information. Respondent 32, a news reporter, stated,

> Whenever an event happens outside, I have to rely on my smartphone to write the news report and send it to my editor immediately. Sometimes, when the interviewing equipment is not nearby, I also need to depend on my smartphone to record the interview process and take pictures of my sources.

Respondent 14, a saleslady, stated that she often relied on her smartphone to answer the queries of her customers and provide them with a quotation for her decorations. Specifically, she stated, "I often go to my customers' apartments to sell them products. Bringing a calculator in my visits is very inconvenient. I instead use my smartphone whenever I need to calculate something, such as the decoration area and quotation."

With regard to employees' dependency on smartphones to record important information, three respondents described smartphones as important gadgets in saving the contact numbers of their work colleagues or clients. Respondent 5, a cashier in a vocational school, stated, "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." In addition, a young media worker (Respondent 29) described that he relied on the memo feature of his smartphone to record important information or tasks. "I am now using [a brand name] smartphone, which has a very powerful memo function. Whenever I come across any new ideas or schedule important appointments, I would type them on my smartphone," he said.

Communication. Depending on smartphones to facilitate communication and interaction with their colleagues and clients is the new relation identified from the current study. Almost all respondents emphasized the indispensable role of smartphones in maintaining their contact with their colleagues and clients. Respondent 1, a 34-year-old IT manager, stated,

> 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 with our customers or partners. They also offer our customers or partners with a convenient way to contact us.

In particular, such dependency is reflected in three smartphone activities, namely, voice calling, social media, and e-mail. For instance, Respondent 26, a middle-level worker in a state-owned enterprise, expressed,

> 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 communicate with one another using this smartphone application even if we are working in different countries.

In addition, some respondents expressed that smartphones help them interact and share work-related information with their coworkers and customers. Respondent 14, a female salesperson, stated

> I have established a WeChat group with all my previous and potential customers. During holidays, I would post my best wishes in the group and interact with the other members. Whenever my company launches a promotion, I also share the promotion news with the group members and even post discount codes in our group.

Task Attributes

The interview results showed that three key task characteristics (i.e., task interdependence, task mobility, and time criticality) are associated with the work-related smartphone dependency of young employees.

Task interdependence

Task interdependence is the first key job attribute that was identified to affect work-related smartphone dependency. According to the coding results, task interdependence was primarily reflected in the coordinating needs of work tasks and high-level work-related communication. Fourteen interviewees indicated that they depend on their smartphones mainly because they are required to coordinate with others frequently in their work. For instance, Respondent 7, a project officer who organizes European tours in a travel agency, explained,

> My job involves communicating with many people and departments, such as the tour guides, oversea hotels, European ambassadors, and customers. If anything happens during the trip, I have to coordinate among them to make sure that the trip would go well. If a customer quits during the tour, I must contact the hotel to change the reservation and then call the flight company to cancel the tickets.

Likewise, Respondent 29, a media professional who produced promotional videos for many companies, stated,

> 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. If my colleagues or clients cannot find me, they will definitely be stuck in their work. Therefore, I have to make sure that I am reachable all the time. That's why I am very dependent on my smartphone.

Regarding the higher level of work-related communication, 15 of the 32 participants reported that their job involves frequent communication with colleagues and/or clients, thereby driving their smartphone dependency. Respondent 13, a sales executive in a textiles manufacturing company, stated,

> Roughly estimated, 80% of my work involves talking with others to increase sales. I keep talking to my sales team or customers every day. Given that most of my colleagues and customers are in different locations, I must rely on some smartphone applications, such as WeChat, to communicate with them.

Similarly, another salesperson (Respondent 19), who works for a new technology company that has branches and clients across the country, also uses smartphones to communicate. He stated, "We cannot meet our customers who are living very far from Shanghai to discuss business-related matters. In this case, smartphones provide us with an important channel to communicate and negotiate with these customers." Other than salespersons, some interviewees in different professions, such as doctors, reporters, project officers, and IT managers, whose work tasks involve engaging in frequent communication, also developed smartphone dependency. For instance, Respondent 3, an IT engineer who carries his smartphone everywhere for work, stated,

> Some of my colleagues worked outside of China. We have to communicate frequently with one another via e-mails or conference calls because we are working on some joint IT projects. Given the differences in time zone, they would call me anytime even if I was off work. When I walk back home, I often attend conference calls to discuss new ideas.

Task mobility

Task mobility is another job characteristic that increased young workers' smartphone dependency at work. Three types of task mobility were distinguished, namely, frequent business travels, frequent outside work, and flexible work location. Regarding frequent business travels, six respondents reported that their work requires them to travel frequently, thereby increasing their work-related smartphone dependency. Respondent 17, a telecom manager whose job involves high mobility, stated,

> Whenever I travel outside, my smartphone is my primary tool for dealing with my work tasks. I rely on smartphone to receive and send e-mails, download work-related documents, and deal with emergent cases. Therefore, my work-related smartphone dependency increases greatly during my travel.

In addition, 14 respondents stated that their job often requires them to work in locations outside their offices, such as in the offices of their clients or in other locations, thereby intensifying their dependence on smartphones. Respondent 19, whose job is to sell new technology products to others, stated, "I have to go to different places every day to promote our products. Because of this high mobility nature, I depend on my smartphone to receive the information and contact my colleagues." Similarly, a junior auditor (Respondent 23) in a famous firm in China also attributed her smartphone dependency to her highly mobilized work. She said,

> I am often assigned to go to different companies to check their auditing accounts. When I am visiting another company, I have to rely on my smartphone to keep in touch with my colleagues and receive information. For instance, if I find anything suspicious in the

> auditing accounts, I have to call my supervisor for further instructions. I also need my smartphone to receive urgent announcements from my company. Therefore, every time I go out of the office, I would make sure that my smartphone is with me and with enough battery power.

With respect to location flexibility, Respondent 28, a young IT engineer who primarily provides IT support to her customers, stated,

> My working location is flexible. My boss doesn't care about my location. He only cares about whether I finished my tasks. As long as I can address my customers' problems, I can work at home, in a coffee house, or anywhere I want. My colleagues often contact me through my smartphone whenever they are looking for me. Therefore, my smartphone is very helpful for my work.

Notably, some interviewees emphasized that task mobility is the most influential factor for their higher levels of work-related smartphone dependency. Respondent 20, a young female lawyer, stated, "If I am in the office, I greatly depend on a computer instead of a smartphone because the latter has a small screen. However, if I am in an outside location, I have no choice but to rely on smartphone."

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 manifested mainly in two dimensions, namely, urgency (the extent to which the tasks needs to be performed promptly) and punctuality (the extent to which the tasks must be performed on time; Yuan et al., 2010). Regarding task urgency, 20 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. Both respondents have to be on call 24 hours and have to attend to their work promptly whenever their smartphones notify them of any urgent news. A young doctor (Respondent 25) 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.

For those respondents who seldom confront urgent cases in their work, their tasks that required prompt responses also increased their smartphone dependency. Respondent 30, a young project officer, stated,

> As you may know, in the consultation industry, our job performance is largely determined by our prompt responses to our customers and our timely provision of the

> best solution to their problems. Therefore, we have to keep our smartphones on and in full power 24/7. Whenever our clients need our suggestions, we have to respond to them straightway.

As for punctuality, some young workers whose jobs do not tolerate delays identified punctuality as an influential factor affecting their smartphone dependency at work. A junior employee (Respondent 23) stated, "I am often required to prepare or revise meeting materials for my boss a few hours before the meeting. If I did not receive her call or e-mail, her meeting would be postponed." Similarly, Respondent 15, a mechanical engineer who designs modern multifunctional car parks, also emphasized the relationship between punctuality and work-related smartphone dependency. He stated,

> In the construction process, if the constructor finds any problem or was confused by my design, he or she would contact me directly. At this time, I have to response to him or her and resolve their problem immediately. If he or she cannot find me, all the construction members—sometimes we have dozens of constructors—have to stop their work, thereby delaying the construction. This delay is unacceptable for us because we have to pay an indemnity for the delay. Therefore, my smartphone is very important during the construction period. I have to make sure that I am reachable all the time.

Organizational Norm

Apart from task characteristics, the organizational norm regarding the smartphone use is another powerful contributor to the work-related smartphone dependency of young working adults in China. The coding results revealed that the organizational norm is primarily reflected in two dimensions, namely, the company valuing the use of smartphones for work-related purposes and the company encouraging the use of smartphones for work-related purposes. For the first dimension, some interviewees mentioned that their organization greatly values communicating in WeChat groups via smartphone. Respondent 27 stated,

> We have a work-related WeChat group. My colleagues enjoy updating their work progress and proposing their questions or ideas in that group. If I don't use the application or participate in the discussion, they may think that I don't take my work seriously or I don't have a team spirit, thereby leaving them a bad impression.

Respondent 20 who also uses WeChat groups for project coordination expressed a similar organizational norm. She stated,

> Our company has various project groups with each project group having a separate WeChat group. My group members enjoy using this group to chat about work-related matters. Sometimes, our boss also distributes new tasks or assignments directly via this WeChat 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 application. Therefore, to maintain effective and satisfying interpersonal associations at work, I have to pay close attention to the activities in my WeChat group using my smartphone.

Meanwhile, 22 young employees reported that their management highly encourages them to use their smartphones for work-related purposes. Two forms of encouragement are identified. The first form is subscribing all organization members to a mobile phone cornet service. Respondent 26 stated, "We can easily call one another by dialing a short number on our smartphones, such as 611 and 612, without charge. Because it is free and convenient, we definitely become dependent on our smartphones for contacting one another." The other form of encouragement is providing a phone bill allowance for their employees, as expressed by the following young project officer (Respondent 30):

> 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. Such arrangement is probably one factor that intensified my dependency on my smartphone at work.

Discussion and Conclusion

This study explored the work-related smartphone dependency relations of young working adults in China and the possible antecedents that influence such dependency. Consistent with MSD theory, the interview results show that young employees depend on their smartphones to achieve their work goals, including understanding, orientation and communication. To some extent, this finding corroborates those of previous studies, which suggested that smartphones have the potential to satisfy various work goals, such as promoting autonomy, facilitating constant connection, accelerating work response, and encouraging information acquisition and sharing (Collins et al., 2015; Lanaj et al., 2014; Perlow, 2012; Pitichat, 2013). More important, this study reveals that the original individual–media dependency relations that were primarily developed from general life settings are not fully applicable to the media dependency phenomenon in work settings. For instance, "play," an MSD key media dependency relation (Ball-Rokeach, 1985), is not applicable in the context of using smartphones for work-related purposes. Therefore, if future research focuses on examining media dependency in specific settings, it must also focus on pertinent dependency relations to ensure the validity of the findings. Besides, the findings also identified work-related smartphone dependency relations from understanding and orientation to communication (e.g., interacting and sharing information). Communication is regarded as the key difference in dependency relations between traditional mass media dependency and new media (e.g., smartphone) dependency. Unlike traditional media, such as newspapers and television that can only provide people with information about their social environment, new media systems, such as smartphones, allow individuals to share and communicate their obtained information with others. This finding suggests that the conceptualization of MSD theory by Ball-Rokeach and DeFleur (1976) can be extended from the one-way broadcasting model of traditional media, in which audiences are treated as passive receivers, to the new media environment. Future studies should pay attention to this changing media dependency relation when applying MSD theory as the theoretical foundation in understanding new media dependency. For instance, instead of limiting themselves to the three main individual-media dependency relations as categorized by Ball-Rokeach (1985), future studies must focus on new emerging relations, such as information sharing and communication, to understand the new media dependency phenomenon.

In contrast to previous research that has emphasized the influence of personal psychological attributes on smartphone dependency (e.g., Lin et al., 2015; Park et al., 2013), this study revealed that the social structure factors of young workers (e.g., job characteristics and organizational norm) were influential in affecting individuals' smartphone dependency. This finding is consistent with MSD theory, which posits that the media dependency of individuals is largely determined by their social structural environment (Ball-Rokeach, 1985). Therefore, future research should take social and structural factors into account to understand the media dependency phenomenon comprehensively. Besides, the identified task characteristics indirectly supported the proposition of MSD theory, which argues that the ambiguity and the degree of threat in individuals' social environments can affect their media dependency (Ball-Rokeach, 1985). Previous studies have found that high task interdependence increases the job uncertainty of an employee because accomplishing work-related tasks requires the cooperation of others (Tushman & Nadler, 1978). Such job uncertainty could place employees in unpredictable or ambiguous situations. Smartphones are personal communication tools that can efficiently help these employees seek information to reduce ambiguities. This study provides indirect evidence for the above proposition by finding that task interdependence could increase work-related smartphone dependency. Similarly, when the job tasks are time critical, they may often encounter urgent cases that must be handled immediately, and these emergencies can easily place these workers in threatening environments. By showing that time criticality could influence work-related smartphone dependency, this study indirectly supports the proposition of MSD theory that threats in the environment could strengthen the media dependency of individuals. In the meantime, consistent with MSD theory, which posits that the activities in interpersonal networks can influence the media dependency (Ball-Rokeach, 1985), this study found that organizational norms regarding smartphone use at work could intensify smartphone dependency at work. If young employees perceive that using smartphones at work is an unwritten rule in their organizational social networks, they tend to rely on such gadgets to maintain satisfactory working relationships with their colleagues. In short, the above discussions show that the basic claims of MSD theory can explain the origins of the work-related smartphone dependency of individuals.

More interestingly, the identified association between three task characteristics and work-related smartphone dependency also can be explained by the theory of task–technology fit, which argues that users adopt a technology based on the fit between their task requirements and technology characteristics (Goodhue & Thompson, 1995). Smartphones are known for their mobility, connectivity, and immediacy (Derks, Duin, Tims, & Bakker, 2015). When individuals' job tasks require frequent communication with others, regular mobility in different locations, and provision of immediate responses, smartphones are the tools that fit employees' job requirements best. Therefore, these working adults become dependent on their smartphones to improve their job efficiency and performance. Task–technology fit theory, which is widely used in the information and management discipline, seldom has been used to understand the new media dependency. This study suggests that such a theory could shed light on the origins of smartphone dependency, especially among working adults. Future studies can continue to examine the applicability of task–technology fit theory in other types of new media dependency.

This study also demonstrated that different job attributes and organizational norms could result in different smartphone dependency relations at work. For example, those employees with high task interdependence are highly dependent on their smartphones to facilitate interpersonal communication,

whereas those employees with high task mobility tend to use their smartphones to understand work-related information or conduct urgent work tasks. This suggests that, when we examine smartphone dependency, it would be better to figure out what kinds of dependency relations individuals develop with their smartphones before exploring their antecedents.

This study offers several important theoretical and practical implications. First, this study significantly contributes to the knowledge of smartphone dependency among young employees from a communication perspective. Unlike previous studies that have emphasized the psychological antecedents of smartphone dependency, this study found that social structural factors (e.g., task attributes and organizational norm) could also intensify the smartphone dependency of individuals. Second, this study enhances our understanding of smartphone dependency in the Chinese working context. For example, young Chinese workers develop various dependency relations with their smartphones at work, especially when they frequently rely on WeChat to communicate and share work-related information. Third, as the first to apply MSD theory to understanding smartphone dependency in the work domain, this study demonstrates that the major claims of MSD theory are still applicable in understanding and explaining the individual–smartphone dependency relations and the antecedents of such dependency in the working context. Therefore, the theoretical application of MSD theory was extended in this article. In practice, this study could help employers and companies understand how and why their workers are dependent on their smartphones at work. For example, this study found that providing phone bill allowance could increase such dependency. As such, if companies aim to encourage their employees to deal with work-related issues through their smartphones toward increasing their work efficiency, offering their employees a monthly phone bill allowance might be an operative way. In addition, given that overdependence on smartphones at work may lead to problematic outcomes, such as increased job stress (Derks & Bakker, 2014), organizations should pay attention to those employees who tend to demonstrate such overdependence to provide a timely solution to the problem during its early stages. According to our findings, if the company aims to promote healthy smartphone use at work, such initiatives should target those employees with high task interdependence, such as salespersons or project coordinators. This study also has limitations. For instance, this study merely emphasized the influence of social structural factors on work-related smartphone dependency. Given that previous studies have shown that some individual factors (e.g., personality traits) could affect smartphone usage and dependency (e.g., Lin et al., 2015), future studies could further examine the influence of individual factors on work-related smartphone dependency to obtain holistic understanding.

In sum, this study presents an in-depth investigation of work-related smartphone dependency relations and the antecedents of such dependency among young working adults in China. The findings provide future studies with a solid foundation to examine such phenomenon among working adults in China and elsewhere.

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