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Abstract

The omnipresent mobile networks, such as Wi-Fi, WLAN, and network provided by mobile operators, facilitate the whole world connected. Mobile technology users can access to the world with the networks, making them feel constant connection to others which predicts the perception of invasion. This study aims to explore the boundary condition of this relationship from two perspectives—individuals' psychological needs and social norms. This study theorizes that psychological needs strengthen the effect of accessibility of omnipresent networks, while social norms weaken that effect. Data was collected from 223 employees with mobile technology usage in their work. The results support our justifications, and discussion and implications are also presented.

Keywords: Omnipresent network, accessibility, constant connectivity, presenteeism, psychological needs, social norms.

1   Introduction

The contemporary world is covered by the omnipresent mobile networks, such as Wi-Fi, WLAN, network provided by mobile operators, and so on. Individuals can use their mobile technologies to access to the omnipresent network, making them feel accessible to the world (Junglas & Watson, 2003). The prevalence of smartphones, which is leading by iPhone and Android Phones, make the network coverage accessible to their users. Users are inclined to access the Internet through their mobile devices. According to Mary Meeker[1] and her team, page views coming from mobile devices cover about 25% of the whole page views in 2014 globally, largely increasing than the same period in 2013 (14%). The Cisco makes a prediction to the future mobile Internet market, and indicates that the number of users who access to the Internet with their mobile devices will increase from 7.4 billion in 2014 to 11.5 billion in 2019. All anecdotal evidences indicate that the accessibility to the omnipresent network is a growing worldwide trend.

This accessibility to omnipresent network in turn renders users to perceive constantly connected with others, including families, peers, supervisors, and so on, through phone calls, instant tools, or other apps. It is termed "presenteeism" in prior studies (Ayyagari, Grover, & Purvis, 2011), and is argued to bring both benefits and unexpected consequences to users, such as increasing the work flexibility, blurring the boundary between work and personal life, and so on(Bittman, Brown, & Wajcman, 2009; Day, Scott, & Kelloway, 2010; Karr-Wisniewski & Lu, 2010). Given the importance of presenteeism, the general objective of this study is to understand the relationship between accessibility to omnipresent network and the perception of presenteeism, and its corresponding conditional constrains.

Prior studies have proposed that employee perceptions of presenteeism leads to work-home conflict, invasion of privacy, work overload, and so on (Ayyagari et al., 2011). However, less is known about in what conditions employees are more likely to perceive connected with their peers or work when exposing to the omnipresent network. Therefore, our research question is specified as: What contingent conditions will influence the relationship between accessibility to omnipresent network and employee perceptions of presenteeism in the context of mobile technology?

To answer this research question, we address on self-determination theory and social norms to explore two types of conditions—individual and social conditions. According to self-determination theory, we theorize that two psychological needs—perceived relatedness and perceived autonomy—strengthens the relationship between accessibility and presenteeism. We further posit that social norms can negatively moderate this relationship as well.

The remaining of the paper is organized as follows. Theoretical background is presented in the section 2, followed by section 3 which proposes our research model and hypotheses. We display our data collection strategy, analyze the data, and show the empirical results in the section 4. Discussion and implications are presented in section 5.

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[1] Mary Meeker is famous at her nickname "queen of the Net". Her primary work focuses on the Internet and new technologies.

2 Theoretical Background

2.1 Accessibility and Presenteeism

Similar with many stationary information technologies, mobile technologies are also distinct at several characteristics as proposed by some researchers. Hong and Tam (2006) have identified three characteristics: (1) One-to-one binding with the user; (2) Ubiquitous services and access; (3) A suite of utilitarian and hedonic functions. Gebauer and Shaw (2004) have considered it from three characteristics: functionality, system performance and user support, and portability. These conceptualizations of mobile technology characteristics are physical characteristics which capture the inherent features, among which ubiquitous access owing to omnipresent network is the key feature. We thus use '*accessibility*' to refer to the extent to which mobile technologies make individuals to access mobile network in anytime from anyplace (Junglas & Watson, 2003). This is the facilitated condition for users to perceive constant connectivity, which refers to that employees perceive mobile technologies penetrate in every corner of their lives and they are available to others anytime and anywhere (Ayyagari et al., 2011). This is named as '*presenteeism*'. When employees perceive high presenteeism, it is likely for employees to be tethered to business-related issues in their personal time and space, to receive more unexpected communications, to be interrupted frequently in their work, and to be required to deal with large amount of information.

2.2 Self-determination Theory

Self-determination theory primarily focuses on individuals' motivations which concern their inherent growth and innate psychological needs (Deci & Ryan, 1985, 2004). Three types of psychological needs are identified: competence, relatedness, and autonomy. Competence refers to the desire to be effective in interaction with social environment and to attain expected outcomes (Deci et al., 2001). Relatedness requires a sense of being connected to others, and of being cared for and caring for by others (Deci et al., 2001). Autonomy involves the desire to be the initiator source of one's own behavior or actions (Deci et al., 2001). This theory indicates that individuals will be self-motivated to perceive positively when these psychological needs are satisfied (Ryan & Deci, 2000).

Previous literature proposes that psychological needs satisfaction enhances individuals' intrinsic motivation (Deci & Ryan, 1985, 2004; Ryan & Deci, 2000), and perceive positive well-beings within organizations (Sheldon & Bettencourt, 2002). Lack of satisfaction leads to negative consequences, such as burnout (Van den Broeck, Vansteenkiste, De Witte, & Lens, 2008). Research in technology acceptance suggests that psychological needs satisfaction can influence individuals' motivations and then predict technology continuance usage (Roca & Gagné, 2008). Therefore, psychological needs exert influences on individuals' motivations to interact with social environments (such as organizations, technology, and so on).

In particular, use of mobile technologies may satisfy employees' needs for relatedness and autonomy, according to the two basic functions—interpersonal communication and information processing (Gebauer, Shaw, & Gribbins, 2010). Specifically, accessibility to omnipresent network facilitates employees to communicate with each other without constrain

of time and places, having the potential to satisfy users' need for relatedness. Further, this also facilitates employees to self-organize their work or deal with business-related information, matching with their needs for autonomy. The satisfaction with relatedness and autonomy will motivate employees to involve with mobile technologies, thus affecting the perceptions about the interaction process. Along with increasing involvement, employees interact intensively with their mobile technologies and connect more with peers and work. We thus theorize that perceived psychological needs, perceived autonomy and perceived relatedness, can positively moderate the effect of accessibility on presenteeism.

2.3   Social Norms

Human beings are social creatures who are regulated by social surroundings and are influenced by social others, termed as social influence. Social influence is critical in shaping individuals' perceptions or behaviors. For instance, TRA or TPB considers subjective norms as a salient factor to affect behavior intention (Ajzen, 1991, 2005). Individuals within a group intend to comply with the social norms, and their perceptions or behaviors are influenced by the norms (Hsu & Lu, 2004).

Social norms consist of two influences—normative social influence, occurring when individuals conform to the expectations of others, and informational social influence, occurring when individuals consider information from others as the reflection of reality (Deutsch & Gerard, 1955). These social influences can exert their effects through three distinct process as proposed by Kelman (1958): compliance, identification, and internalization. Compliance occurs when one wants to achieve an approval and to avoid punishment from social group; identification occurs when one hopes to maintain a satisfying and reciprocal relationship with social group; and internalization occurs when one finds out that the actions or ideas are congruent with his/her own value system (Kelman, 1958; Tsai & Bagozzi, 2014).

In the contemporary world surrounding with various information technologies, employees encounter in two primary categories of social norms—norm of responsiveness and norm of anxiety (Barley, Meyerson, & Grodal, 2011). Synchronous and asynchronous information technologies change the expectations of employees, representing as two aspects—expectations of responding as quickly as possible and expectations of not falling behind other or not missing important information. These two social norms become more salient in the context of mobile technology, which offer omnipresent network to employees such that they are expected to access various communication and information requirements anywhere and anytime. We argue that employees are affected by these social norms, which shape their interaction process and perceptions with mobile technologies. With such social norms, employees are inclined to feel more connected because they are expected to, even they do not encounter in a high level of accessibility to the network.

3   Research Model and Hypotheses

With above discussions, we develop our research model and hypotheses. The research model is depicted in Figure 1.
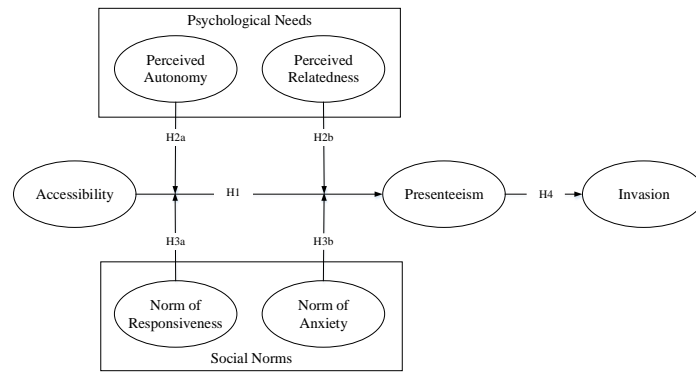
Figure 1. Research Model

Exposed to various mobile networks (i.e., WLAN, Wi-Fi, etc.), users can access to the network without consideration of time and places. We thus use 'accessibility' to refer to the extent to which mobile technologies make individuals feel that they can access mobile network in anytime from anyplace (Junglas & Watson, 2003). Owing to the accessibility, employees can connect to and be connected by their peers or business-related issues anywhere and anytime (Hong & Tam, 2006). Employees, who perceive a high level of accessibility, are inclined to regard themselves more available to others. Therefore, we hypothesize that:

H1: Individual perception of accessibility is positively related to the presenteeism.

Psychological needs are closely associated with intrinsic motivation, and enhance the motivations when these needs are satisfied (Deci & Ryan, 1985, 2004; Ryan & Deci, 2000). When using mobile technologies, the accessibility to omnipresent network can satisfy employees' needs for relatedness and autonomy, because they can communicate with others or self-organize their own schedules (Davis, 2002; Day et al., 2010; Middleton & Cukier, 2006). Accordingly, employees who have high level of psychological needs for autonomy and relatedness are likely to feel satisfied with accessibility to mobile networks. They are motivated to interact more with their mobile technologies through a high frequency of interpersonal communication and information processing, thus feeling more constantly connected with others.

Previous research proposed that satisfaction of psychological needs can shape the influence process of motivations. For instance, Ke and Zhang (2010) explored the underlying reasons for OSS developers to take efforts on OSS tasks, and found out that satisfaction of psychological needs positively moderate the relationships between extrinsic motivations and task efforts. In the context of mobile technology, accessibility to mobile network can also be considered as a special type of motivation to trigger users keep connected with others. Therefore, we argue that employees who possess high perceived psychological needs tend to interact more with their mobile technologies and peers in a given level of network coverage, resulting in a higher level of constant connectivity. The hypotheses are presented as below:

H2a: Perceived autonomy strengthens the effect of accessibility on presenteeism; such that this relationship is stronger for individuals who have high level of autonomy need.

H2b: Perceived relatedness strengthens the effect of accessibility on presenteeism; such that this relationship is stronger for individuals who have high level of relatedness need.

Various information technologies, especially mobile technologies which lead employees to carry devices and to access mobile network, are entangling with and reshaping the social norms (Mazmanian, Yates, & Orlikowski, 2006). First, employees involve the 'norm of responsiveness' that refers to the extent to which individuals perceive a social pressure of response quickly (Barley et al., 2011). Employees are expected to respond to requirements for communication and information processing as quickly as possible, to adapt the contemporary competitive world. When this norm is formed, employees are accustomed to respond in a quick way no matter in what conditions, resulting in a higher sensibility to connect to and to be connected by others even when exposing to high network coverage. In this situation, employees are more likely to perceive a high level of constant connectivity, even that they are less accessible to the mobile network. We thus hypothesize that:

H3a: Norm of responsiveness weakens the effect of accessibility on presenteeism; such that this relationship is weaker for individuals in a high level norm of responsiveness.

The second type of social norm is known as 'norm of anxiety', which is the extent to which individuals perceive social pressure of being falling behind in one's work or missing important information (Barley et al., 2011). The contemporary work environment becomes highly competitive and fast-changing, within which employees are faced to the fear of not catching up with others or not getting the latest information (Barley et al., 2011). Employees who are in a high level of this norm have the strong needs to keep contact with peers or their work, attenuating the effect of accessibility. Therefore, we hypothesize that:

H3b: Norm of anxiety weakens the effect of accessibility on presenteeism; such that this relationship is weaker for individuals in a high level norm of anxiety.

Prior studies in technostress have indicated that the constant connectivity leads employees think that they are never free of work and their private space and time are invaded by use of mobile technologies (Ragu-Nathan, Tarafdar, Ragu-Nathan, & Tu, 2008; Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2007). Ayyagari et al. (2011) empirically tested the effect of presenteeism on work-home conflict, and indicated that individual perception of presenteeism increases the conflict between work and home. Thus, we also argue that presenteeism accelerates the feeling of invasion, which refers to the extent to which individuals feel that their private life are invaded by their mobile technologies (Ragu-Nathan et al., 2008; Tarafdar, Tu, & Ragu-Nathan, 2010; Tarafdar et al., 2007). We hypothesize that:

H4: Individual perception of presenteeism is positively related to invasion.

4 Methods

A self-reported survey was utilized to test the proposed research model and hypotheses. Our research objective was to explore the use of mobile technology activities for employees; consequently, working people with mobile technology usage in their workplace were our target respondents. To ensure participants understand our questionnaire, we added one general question in the very beginning of the whole questionnaire to ask people to tick off the mobile technology that was the most frequently used in their professional lives.

4.1 Measurement

Presenteeism refers to the extent to which mobile technologies make individual feel that they are available to others anytime and anyplace, and is measured with four items adopted from Ayyagari et al. (2011). Two psychological needs, perceived relatedness and perceived autonomy, are measured with items adapted from the study of Sheldon and Bettencourt (2002). Invasion was measured with four items adopted from Ragu-Nathan et al. (2008). The other three constructs—accessibility, norm of responsiveness, and norm or anxiety—are measured with self-developed items. All the items were measured with 7-Likert scale, and the whole instrument was shown in Appendix A.

4.2 Data Collection Procedure

The questionnaire was created and distributed in an online survey-related service website in China[2]. We gave 10RMB to each subject to appreciate their participations. After two weeks, a total of 223 responses were received. About 43.9% of the participants were male, and 68.2% of them were in the age range of 25 to 35 years. Over 80% of participants have undergraduate or postgraduate degree. The most frequently used mobile technologies are smartphones (about 68% of participants). Our respondents are from various industry, including Government and education (12.1%), manufacturing industry (13.5%), information industry (22.4%), service industry (39.9%), and others (12.1%), generalizing our results to different industries.

4.3 Data Analysis

4.3.1 Measurement Model

We assessed reliability and construct validity with the confirmatory factor analysis (CFA). First, reliability was evaluated with three criteria, including Crobach's Alpha, composite reliability, and Average Variance Extracted (AVE). These three criteria are suggested to achieve the threshold of 0.7, 0.7, and 0.5 respectively. The results in Table 1 indicated that all these three criteria have reached the suggested threshold values, with Cronbach's Alpha values from 0.786 to 0.953, composite reliability values from 0.840 to 0.966, and AVE values from 0.574 to 0.876. Second, convergent validity was assessed by checking the item loadings with the same construct were above 0.600 (Chin, Gopal, & Salisbury, 1997). The results in Table 2 proposed that except for the third item of invasion (0.595) that was marginal, the other item loadings all satisfied the recommended benchmark. Third, discriminant validity was verified by checking whether the square root of the AVE for each construct is greater than the correlations between the constructs (Fornell & Larcker, 1987). We found from the results in Table 1 that our instrument satisfied both criteria, suggesting the good discriminant validity. Overall, our instrument achieved the criteria for reliability, convergent validity, and discriminant validity, indicating the satisfactory quality of measurement.

4.3.2 Structural Model

The results of data analysis was presented in Figure 2. As hypothesized, accessibility to omnipresent network significantly increases individual perception of presenteeism (beta =

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[2] SOJUMP, URL: http://www.sojump.com/

0.292, t = 4.419, p < 0.001), thus supporting H1. Further, perceived relatedness was found to strengthen the relationship between accessibility and presenteeism (beta = 0.236, t = 2.001, p < 0.05), thus H2b was supported. However, the moderating effect of perceived autonomy was not found (beta = 0.051, t = 0.443, n.s.), rejecting H2a. As to social norms, it was proven that the norm of responsiveness weaken the relationship between accessibility and presenteeism (beta = -0.346, t = 3.151, p < 0.01), supporting H3a. While H3b was not supported that we failed to find the moderating effect of norm of anxiety (beta = -0.123, t = 0.950, n.s.). Further, individual perception of presenteeism was found to positively predict invasion (beta = 0.275, t = 4.249, p < 0.001). Overall, about 22.2% of variance for presenteeism was explained, and about 7.5% of variance for invasion was explained. The two moderating effects are illustrated in Figure 3.

	Cronbachs Alpha	Composite Reliability	AVE	1	2	3	4	5	6	7
Accessibility	0.953	0.966	0.876	0.936						
Presenteeism	0.887	0.922	0.747	0.313	0.864					
Perceived Autonomy	0.786	0.870	0.693	0.259	0.302	0.833				
Perceived Relatedness	0.876	0.923	0.800	0.363	0.278	0.520	0.894			
Norm of Anxiety	0.933	0.952	0.833	0.228	0.323	0.409	0.476	0.913		
Norm of Responsiveness	0.873	0.913	0.725	0.251	0.394	0.474	0.513	0.588	0.851	
Invasion	0.801	0.840	0.574	0.173	0.275	0.116	0.117	0.300	0.188	0.757

Note: The diagonal is the root square of AVE.
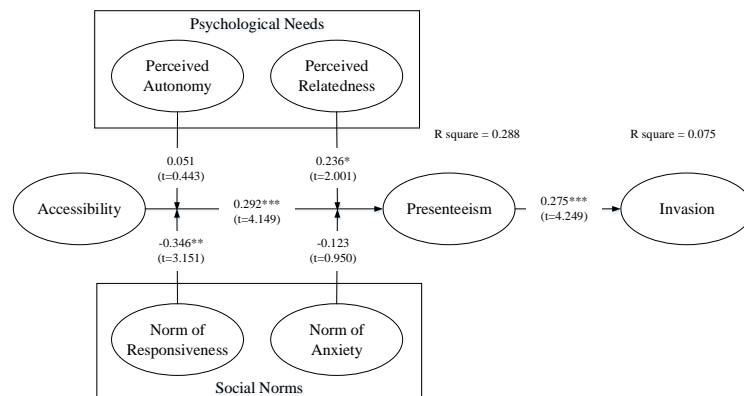
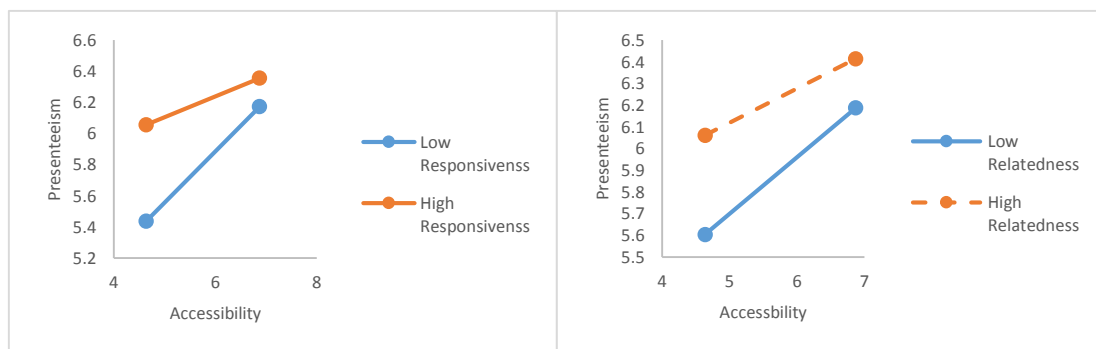*Table 1. Reliability and Correlations*

Figure 2. Structural Model

Figure 3. Interaction Effects between Norm of Responsiveness/Perceived Relatedness and Accessibility

5 Discussion

5.1 Key findings

This study aims at exploring the contingent conditions of the relationship between accessibility to omnipresent network and employees' perceptions of presenteeism in the context of mobile technology. Our empirical results suggest that accessibility predicts individual perception of presenteeism, which in turn increases the perception of invasion. This result is consistent with arguments and conclusions in prior literature (Ayyagari et al., 2011; Ragu-Nathan et al., 2008).

Second, our results also indicate that perceived relatedness is an important contingent condition to understand the effect of accessibility on perception of presenteeism. However, the moderation effect of perceived autonomy was not verified. A plausible explanation might be that the most frequently used mobile technology is smartphones, which are typically used for interpersonal communication, through traditional phone calling or communication applications. Therefore, anytime and anywhere accessibility to mobile network can satisfy the sense of being connected to others and of being cared for and caring for by others (Deci et al., 2001), leading perceived relatedness more important in the current context.

Third, our results proposed that employees tend to perceive high presenteeism when involving a high level of social norm of responsiveness, even they are less accessible to mobile network. Prior studies indicate that emergence and development of various information technologies reframe individual expectation for response time, raising up a social norm of speed and instantaneity (Day et al., 2010; Isaac & Leclercq, 2006). Within this situation, employees highly expect to constant connect with and are highly expected to be connected by others. Nevertheless, norm of anxiety was not found to have moderation effect. This may be explained by widespread of mobile technologies in the workplace, such that mobile technologies may not be considered as unique resources for employees to compete with others. Therefore, employees' fear of being behind others cannot influence their judgment about the effects of mobile technologies.

5.2 Limitations

This study has several limitations which are needed to be discussed. First, a self-report survey was utilized as data collection technique in this study, which may suffer from the problem of self-selection bias. Thus, future studies should adopt other data collection strategies to replicate our proposed hypotheses. Second, the empirical setting of this study is China which embraces the collective culture. Thus, our samplings are inclined to be influenced more by social norms; such that the empirical results should be explained with caution. Future research could extend this study and its conclusions across different cultural settings to enhance its generalizability. Third, we did not distinguish among different industrial features for generalizability, which may limit the observation for nuance understanding of social norms across industries. As known, different industries have different features, and also have different requirements for employees. Therefore, industry type may play a role in shaping employee perception about constant connectivity in the context of mobile technology. Future research could empirical test the effect of industry type to offer a more nuance understanding of our research model.

5.3　Implications

5.3.1　Theoretical Implications

This study contributes to the existing literature in the following ways. First, it contributes to the existing literature of mobile technology by exploring the boundary conditions of the effect of accessibility to mobile network on individual perception of constant connectivity. Prior literature primarily focused on the consequences of constant connectivity (termed as presenteeism in the mobile technology context) (Ayyagari et al., 2011; Hung, Chang, & Lin, 2011; Ragu-Nathan et al., 2008; Tarafdar et al., 2007). However, the core concept 'presenteeism' *per se* are less discussed. We offer a relatively new insight to understand the phenomenon of constant connectivity by taking one of its antecedents (accessibility to mobile network) and corresponding boundary conditions into account through both individual and social perspective. This insight could encourage researchers to focus more on the constant connectivity phenomenon itself.

Second, we extend the self-determination theory into the context of mobile technology by introducing perceived psychological needs, relatedness and autonomy in particular, as an important boundary condition in understanding constant connectivity. In so doing, our study empirically validates the crucial role of self-determination theory in shaping employees' perceptions of constant connectivity. The accessibility to mobile network has the potentials to satisfy individual psychological needs, which could motivate employees to interact more with their mobile technologies and other users. This study finds out that perceived relatedness is a notable moderator, adding to the mobile technology literature which has overlooked the focal phenomenon.

Third, this study contributes to social norms studies by extending its applicability to the domain of mobile technologies. Although social norms have been widely studied to explain individual behaviors such as technology acceptance and usage (Hsu & Lu, 2004; Shen, Cheung, Lee, & Chen, 2011; Venkatesh & Davis, 2000) and knowledge contribution behavior (Tsai & Bagozzi, 2014; Wang, Meister, & Gray, 2013), its ability in shaping individual perception of mobile technologies has yet not to be tested, despite the study of Barley et al. (2011) suggesting the use of e-mail as a symbol of stress because of social norms formation. Our research findings extend the role of social norms to the contemporary mobile technology driven work environment by showing that norm of responsiveness is a key moderator to shape the perception of constant connectivity.

5.3.2　Practical Implications

In terms of practical implications, our study and research findings offer managers how to modify employees' perceptions of constant connectivity, through which managers can control for employees' perception of invasion and technostress. Specifically, we propose that employees who involve in the work environment with high social norm of responsiveness tend to perceive constant connectivity, even they are less accessible to mobile network. That is, even under situations of low network coverage, these employees perceive a higher level of constant connectivity because they are required to respond to others as quickly as they can. It stresses

the crucial role of social norms, and suggests managers to build such social norm, and to encourage employees with culture of speed and instantaneity.

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Appendix A

Constructs	Items
Presenteeism (Ayyagari et al., 2011)	1. The use of this mobile technology enables others to have access to me at anytime and anyplace. 2. This mobile technology makes me accessible to others at anytime and anyplace. 3. The use of this mobile technology enables me to be in touch with others at anytime and anyplace. 4. This mobile technology enables me to access others at anytime and anyplace.
Accessibility (Self-Developed)	1. Using this mobile technology enables me to have access to mobile network (i.e., Wi-Fi, WLAN, network provided by mobile operator, etc.) at anytime and anywhere. 2. I am able to get into mobile network (i.e., Wi-Fi, WLAN, network provided by mobile operator, etc.) with this mobile technology at anytime and anyplace. 3. This mobile technology makes mobile network (i.e., Wi-Fi, WLAN, network provided by mobile operator, etc.) accessible to me at anytime and anywhere. 4. I can use this mobile technology to gain access to mobile network (i.e., Wi-Fi, WLAN, network provided by mobile operator, etc.) at anytime and anyplace.
Norm of Responsiveness (Self-Developed)	1. I think people who I work with response to one another as soon as possible. 2. I think people I work with have the expectations of getting responses from others as soon as possible. 3. I think it is a manner for people I work with to respond as soon as possible. 4. Overall, I think quick response is an implicit norm among people who I work with.
Norm of Anxiety (Self-Developed)	1. I think people I work with have a fear of being behind and missing important information. 2. I think people I work with are worried then they are behind and missing important information. 3. I think people I work with are afraid of being behind and missing important information. 4. I think people I work with become anxious when they are lagged behind and missing important information.
Perceived Relatedness (Sheldon & Bettencourt, 2002)	1. In job, it is important for me to have a sense of contact with people who care for me, and whom I care for. 2. In job, it is important for me to be close and connected with other people who are important to me. 3. In job, it is important for me to have a strong sense of intimacy with the people I spent time with.
Perceived Autonomy (Sheldon & Bettencourt, 2002)	1. In job, it is important for me to feel free and choiceful. 2. In job, it is important for me to feel wholehearted uncontrolled or unpressured. 3. In job, it is important for me to express my authentic self.
Invasion (Ragu-Nathan et al., 2008)	1. I have to be in touch with my work even during my vacation due to this mobile technology. 2. I spend less time with my family due to this mobile technology. 3. I feel my personal life is being invaded by this mobile technology. 4. I have to sacrifice my vacation and weekend to keep current on work information through this mobile technology.