MOBILITY EXPERIENCES IN EVERYDAY LIFE

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Abstract

Mobile technology has significantly transformed how, when and where work routines and personal activities are conducted. The wide acceptance and broad integration of mobile devices into work and non-work domains have brought a new set of challenges that require fresh theorising of what constitute mobility experiences and their intricate relationships. In this research, we examined patterns of use, the spatiotemporal meanings of work and non-work as well as the emerging perceptions of mobility experiences. Our empirical setting is a university in New Zealand where we collected data from academic and non-academic staff. Our findings confirmed that mobile-enabled work activities interfere with the non-work realm. More importantly, we discovered the mutual influence between spatiotemporal meanings and the use of mobile devices, leading to emerging perceptions of mobility experiences. These perceptions are manifested as unsolved controversies, accommodating attitude, constant agitation and crisscrossing spheres.

Keywords: Mobile computing, IS use, mobility, time, space.

INTRODUCTION

In recent decades, there has been a significant change in the landscape of information technology (IT). Two important IT trends have transformed work routines and personal activities. The computerisation of work routines and the advanced mobile and network technologies have shifted from the traditional 9-to-5 to anywhere/anytime work arrangement. The International Data Corporation predicts that mobile workers will reach 1.3 billion or 37.2% of the total workforce in 2015 (IDC, 2012). The mass consumerisation of mobile devices is another trend. For example, the International Telecommunication Union reports that there were more than 6 billion mobile cellular subscriptions worldwide in 2011. Surprisingly, 105 countries had more mobile cellular subscriptions than their population (ITU, 2012).

Mobility has shaped many aspects of everyday life by enabling us to extend our human connections across geographical boundaries and engaging in work practices beyond an office wall. Information systems (IS) research has examined several questions related to mobile device usage largely from a workplace perspective. Several terms have been introduced to discuss the role of mobile devices in our society. Some of these include “anytime/anyplace computing” (Davis, 2002), “mobile computing” (Lyytinen & Yoo, 2002), “nomadic computing” (Cousins & Robey, 2005) and also simply “mobility” (Kakihara & Sørensen, 2002; Pica & Kakihara, 2003).

However, the increasing use of mobile devices across work and personal activities reveals significant challenges around mobile-mediated activities. Some people may have mixed feelings in their relationships with mobile devices.

Headlines from the popular press[1] are good examples to illustrate this point: “Is your smartphone making you less productive?” asked the Harvard Business Review Blog; “Who’s the Boss, You or Your Gadget?” asked the New York Times.

Despite past research efforts, we do not have a full account of what it is like to live with mobile computing (van Manen, 1990). In other words, very little is known about layers of mobility experiences across work and non-work domains, how routine use of mobile computing shapes and is shaped by the meaning of work and non-work space and time, and the emerging perceptions of mobile computing experiences. Our approach, which aims at discovering the practice and meaning of engaging with mobile computing, offers a more accurate theorising of mobility across the work and non-work domains. Our fundamental assumption is that the lived experiences of mobile device users are constructed and reconstructed through their technology-mediated everyday practices. Thus, the research questions are:

> *How does the use of mobile computing devices shape users’ spatiotemporal meanings of work and non-work domains?*
>
> *How do spatiotemporal meanings of work and non-work domains shape the use of mobile computing devices?*
>
> *What are the emerging perceptions of mobile computing experiences from everyday use of mobile computing devices in work and non-work domains?*

We begin with an overview of the state of knowledge in mobility literature. Next, we present a framework of mobility experiences that guides our empirical study. The subsequent section describes our methodological procedures followed by

[1] These articles are available from:
http://blogs.hbr.org/cs/2012/04/is_your_smartphone_making_you.html and
http://www.nytimes.com/2011/02/06/business/06limits.html?pagewanted=all

our analysis and discussion of results. The last section presents the conclusions of our study.

MOBILITY IN THE LITERATURE

Mobile devices provide individuals with significant flexibility both in their work and non-work activities. Traditionally, work-related activities have been tightly performed in specific physical workplaces such as an office or a shop store. The emerging mobile technology and the increasing digitisation of work activities have enabled individuals to perform their work in myriad places such as at home, in a car, in a café, at a beach and so on. Also, work activities may no longer be restricted to the traditional 9-to-5 model because mobile computing makes it possible to work outside these hours. In other words, work activities can be stretched in both the time and space dimensions.

While the influence of mobility has been the focus of previous studies (Arnold, 2003; Chesley, 2005; Golden & Geisler, 2007; Middleton & Cukier, 2006; Perry, O'Hara, Sellen, Brown, & Harper, 2001; Prasapolou, Pouloudi, & Panteli, 2006; Schlosser, 2002), its multidimensional nature is evidenced by numerous definitions put forward by various researchers without a clear consensus on the meaning of mobility. Some researchers conceptualise the notion of mobility, simply in terms of the lack of physical restrictions. For example, mobility is defined "exclusively in terms of humans' independency from geographical constraints" (Kakihara & Sørensen, 2002, p. 1). Table 1 shows how mobility – and its associated terms – has been theorised in previous studies.

Table 1: Mobility Concepts		
Concept	Definition	Authors
anytime/anyplace computing	"has access at all times and all places to all information and communication resources"	Davis (2002, p. 69)
mobile computing	"fundamentally about increasing our capability to physically move computing services with us"	Lyytinen & Yoo (2002, p. 63)
mobile communication	use of "individualized, distributed capacity to access the local/global communication network from any place and at any time"	Castells et al. (2007, p. 248)
nomadic computing	"provide transparent, integrated, convenient and adaptive communication and computing services to nomadic workers as they move from place to place"	Cousins & Robey (2005, p. 152)
mobile technology	"handheld IT artefacts that encompass hardware (devices), software (interface and applications), and communication (network services)"	Jarvenpaa & Lang, (2005, p. 8)
system mobility	"the extent to which the system provides users with access to information resources irrespective of their location within the system's boundaries"	Kourouthanassis, Giaglis & Karaisko (2010, p. 278)
mobility	"mobilised situatedness of interaction in particular contexts and relations of social lives"	Kakihara & Sørensen (2002)
mobility	"stability in the interaction with routines creates/enables fluid organizations; in turn, increasingly fluid work practices require a blurring of the traditional boundaries of work and leisure, of virtual and real"	Pica & Kakihara, (2003, p. 9)
mobility	"Humans are influenced in three ways by mobile devices. These are operational, locational mobility and interactional mobility."	Pica, Sørensen & Allen (2004)
mobility	"a matter of shifting contexts; of changing involvements"	Fallman (2005, p. 6)

Drawing on previous conceptualisations, we use the concept of mobile computing to represent the ubiquitous role of mobile devices in everyday life experiences given by its two defining features: mobility and connectivity. Mobility is characterised by the capacity to carry computing services in multiple spaces (Castells, Fernández Ardèvol, Qiu, & Sey, 2007). Connectivity is characterised by the capacity to access information, people and other resources through communication networks from any place at any time (Green, 2002). Together, mobility and connectivity changes where, when and how work and non-work activities are conducted. Hence, it is possible to carry work and engage in work activities outside the workplace.

Border theory offers a useful understanding of the fluid relationship between work and non-work domains (Clark, 2000). This theory argues that individuals make transitions between work and non-work worlds and, by doing so, shape the relationships with those two worlds and their members. Following the logic of

border theory, we can view mobile technologies as bridges between work and non-work domains. For example, an individual can receive a call from an employer on her mobile phone while she is at home. The act of answering the phone creates a permeable boundary condition that allows the person to undergo a psychological micro transition from the non-work to work domain (Ashforth, Kreiner, & Fugate, 2000). Since mobile technologies are no longer limited to workplace use, activities from the non-work domain can easily cross over to the work domain and vice versa. This phenomenon is referred to as border permeability (Clark, 2000). For example, mobile technologies allow employees to perform some of their non-work activities during normal working hours, such as personal online banking, online shopping or chatting with friends (Middleton, 2008).

Research findings on the impacts of mobility are mixed. The positive and negative impacts of mobility are conceptually inseparable. Some studies suggest that mobility may lead to a conflict between work and non-work domains. Evidence from literature suggests that the spill-over of work activities into non-work domain through the use of mobile devices increases work-life conflict (Boswell & Olson-Buchanan, 2007). Middleton (2008) explains how it is possible for work to interfere with non-work activities when individuals bring their laptops, BlackBerrys and mobile phones along with them when they are on vacation. Overall, this body of work seems to imply that, with an increasing use of mobile devices, work is more likely to negatively intrude on non-work domains. On the other hand, other studies suggest that the use of mobile technology can create positive outcomes by allowing individuals to perform tasks relating to both work and non-work domains regardless of their locations (Schlosser, 2002). Enabling individuals to work anywhere/anytime and providing 24/7 connectivity to the

workplace, mobility adds flexibility to people's lives, according to some authors (Green, 2002; Schlosser, 2002; Towers, Duxbury, Higgins, & Thomas, 2006).

However, any attempt to label the overall experience of using mobile devices as either positive or negative is an oversimplification of the complex nature of mobility. The implications of using mobile technologies cannot be reduced to a dichotomous situation. In this study, we stress the need to understand the intricacies of mobility and how individuals manage the tensions mobile technologies engender. Few studies suggest that mobility may lead to paradoxical experiences with the co-existence of positive and negative outcomes (Golden & Geisler, 2007; Jarvenpaa & Lang, 2005; Pauleen & Harmer, 2008; Schlosser, 2002; Towers et al., 2006). From a positive perspective, individuals can use mobile devices as a tool to manage their work and non-work boundaries (Cousins & Robey, 2005; Golden & Geisler, 2007). In contrast, the use of mobile technologies may be associated with negative outcomes such as work extensions (Towers et al., 2006), high expectation of availability from employers (Schlosser, 2002; Towers et al., 2006) and the blurring of multiple work and personal roles (Schlosser, 2002). Jarvenpaa and Lang (2005) reported how users experience various conflicting situations engendered by mobile technology. On the one hand, users appreciated increased productivity, enhanced flexibility and more efficient ways to perform work. On the other hand, users also experienced increased workload, increased expectation from employers and inability to separate work and personal life.

Evidence from the literature suggests that conflicting mobility experiences are not the anomaly but rather the common theme that needs to be recognised and further investigated. Green (2002) describes the contradiction in mobile communication as "social space and time are extended [and simultaneously] remain locally continuous" (p. 291). This is because mobile technology enables

users to engage in social interaction with someone at a distance as well as with those in the vicinity. Other researchers also offer evidence to support contrasting mobile experiences. Davis (2002) posits that mobile technology causes interruptions but at the same time allows individuals to continue performing their activities without abandoning them altogether – e.g., taking a customer's call while fishing. This situation reflects the duality that mobile technologies afford, whereby personal activities can be carried out along with work activities (Gant & Kiesler, 2002). Mobile technology can also control as well as empower users (Sherry & Salvador, 2001) – e.g., the same technology that allows the manager to control a salesperson by tracking her location also allows the salesperson to make a deal by beating competitors' offer on the spot.

Our review suggests that previous studies have largely focused on the use of mobile devices in work contexts only. In this research, we aim to theorise and empirically examine mobile technology experiences in people's lives through their everyday use of mobile technology in work and non-work activities, the evolving meaning of space and time, and the emerging perceptions of mobile computing experiences. Our work is different from previous studies in at least two ways. First, our broader view of mobile computing use across work and non-work practices offers rich theorising of the encompassing role of mobile devices and their implications on people's digitally mediated life experiences (Bødker, Gimpel, & Hedman, 2012; Yoo, 2010). Second, we use experiential computing as an inquiry lens to understand the relationship between mobile technology, context and actors in the spatiotemporal domain.

A FRAMEWORK OF MOBILITY EXPERIENCES

We develop a framework that helps guide theory development around complex mobile computing experiences in everyday life. We assume that the meaning of technology to people's lives is constructed and reconstructed through their

technology mediated lived experiences. We focus on three elements that constitute mobile computing experiences: *mobility-in-action, spatiotemporal meanings and perceptions of mobile computing experiences*.

Grounded in an experiential computing view, mobility-in-action represents the *dynamic enactment of mobile computing to transition between work and non-work activities in multiple spaces through allotments of time*. This definition draws on elements of various conceptualisations of mobility in the literature (see Table 1) and reflects the evolution of mobile computing in modern lives. The transition between work and non-work activities is enacted by individuals and enabled by mobile devices. Space is where social practices take place (Castells, 2000), while time represents the sequence around which human activities are organised (Dubinskas, 1988). These two dimensions are closely interlinked; the space-time system provides the framework to understand social actions (Harvey, 1990), mediated by mobile devices.

We next discuss the emerging meaning of space and time in relation to mobile computing use. The introduction of mobile technology has produced a distortion on the meaning of the space-time dyad. Time-sharing activities do not necessarily mean contiguous practices anymore; coordinated social activities can now be performed at a distance (Green, 2002). Executing activities no longer require the physical presence of individuals at a particular place and time. Everyday examples illustrate the intricate nature of this natural link. For instance, the idea of office hours, a term whose meaning has been socially constructed and accepted, has embedded the two dimensions of the spatiotemporal sphere: space (i.e., office) and time (i.e., work hours). Meetings, lectures, appointments, projects and itineraries, among other human activities, inevitably contain explicit references to space and time.

Time has been a particularly elusive concept. The instantaneity of the present moment and the inexorability of its constant flow represent a challenge for defining time. In this study we begin with the view of time as "a nonspatial dimension in which events occur in apparently irreversible succession from the past through the present to the future" (Ancona, Okhuysen, & Perlow, 2001, p. 513). This conceptualisation of time provides the analytical elements for our study: one at the individual level and the other at the social level. This definition makes explicit the subjective process by which people exercise selective attention and interpretation of the perceived passage of time (Flaherty, 2003). In other words, how time is interpreted is an idiosyncratic experience where the current moment encapsulates past experiences, present circumstances and imagined futures of the individual (cf. Emirbayer & Mische, 1998). Moreover, the intensity of the lived current moment may create a status of temporal dissociation, by which the user momentarily loses the ability "to register the passage of time" (Agarwal & Karahana, 2000, p. 673). This status of temporal dissociation resonates with the notion of timeliness that occurs when "attention is withdrawn from the self, and time as experience ceases to exist" due to the profundity of the lived moment (Mainemelis, 2001, p. 551).

The previous discussion takes us to a crucial point, which is relevant for this study: how mobile device users experience time in organisations. From an organisational perspective, the commoditisation of time in Western societies is predominant. Time has become to be perceived as "a resource that can be measured, standardized, used, bought, and sold" (Ancona, Okhuysen, et al., 2001, p. 515). This view assumes that the time individuals spend performing work activities is clearly defined within specific temporal boundaries. However, the pervasiveness of mobile technology makes this view of time somewhat reductionist, if not obsolete. The notion of personal time may have disappeared.

Using mobile technology is a social activity that entails interdependent actions and multiple actors. The time individuals spend performing work activities is heavily influenced by organisational habits, which are not necessarily aligned with the traditional definition of work time (i.e., the 9-to-5 model). The notion of timing norms – which "govern a wide range of behaviors in organizations… people experience as shared, expected patterns of paced activity" (Ancona, Goodman, Lawrence, & Tushman, 2001, p. 648) becomes an important concept to understand how mobile device users experience time in organisations.

The notion of space is a socially constructed abstraction (Giddens, 1990). Two characteristics of social spaces are relevant to understand mobile-enabled experiences: the multiple social interactions they afford (Massey, 1994) and the interaction with the absent others (Giddens, 1990). Social spaces are not necessarily restricted to a unique space defined by its location; quite often, multiple social spaces can be embedded in an easily recognisable space. In this way, the interconnection among cubicles and the area they share in an open floor office provides the intersection of different social practices. Social spaces support the interaction at a distance. For instance, a telephone conversation, regardless of whether the communication partners are next door neighbours or are located in different continents, facilitates the coordination of social activities regardless of distance.

METHODOLOGY

Understanding how mobile devices shape spatiotemporal meanings of both work and non-work domains requires an empirical examination of the users' experience. This study was conducted at one of the faculties of a New Zealand university. This faculty was chosen because, by the end of 2011, its administrators decided to supply tablets (i.e., iPads with 3G wireless) to its academic and non-academic staff. Both academic and non-academic staffs have

the characteristics of knowledge workers, who are less constrained from rigid office hours and locations than other workers. Having everyone equipped with the same mobile technology afforded a rare opportunity for studying mobile computing experiences. Our participants are mostly at the stage in which mobile devices became “an ordinary part of everyday life” (Bødker et al., 2012, p. 15).

The data collection, which spanned from February to June 2013, was conducted in three sequential stages: a questionnaire, a diary and an interview. We obtained 63 completed questionnaires out of 159 individuals who were invited to participate in this study. The questionnaire included a section with questions about demographic information – i.e., age bracket, gender, level of education, household composition, time working for the faculty, current position and time working in the current position. See Table 2 for selected demographic information.

Table 2: Selected Demographic Information (No of participants)

Gender	Male	21
	Female	42
Job position	Academic staff	31
	Non-academic staff	32
Age bracket*	20-30	2
	31-40	16
	41-50	19
	51-60	19
	61 and above	6

*One participant did not disclose his/her age bracket.

Another section included two open-ended questions about participants’ feelings when they first got the tablet and their feelings now after having experienced the tablet for one year or so. Twenty participants used the word “excited” to describe their feeling when they first learned that they will get an iPad. Some interesting responses of participants’ feelings towards the iPad after one year are: “I love it. It makes life easier to deal with work emails… more than happy to do this in my own time so I am not inundated with emails when I get to work.”, “… iPad comes

with an expectation to do work related tasks during weekdays" and "attached, as part of my daily life".

In addition, participants were asked to indicate the types of mobile devices they have available for their use (i.e., smartphone, tablet, laptop or a combination of them) and whether or not they were provided by their employer. Another section contained six statements on a 5-point Likert scale about participants' beliefs about the interference between work and non-work activities. The majority of participants (39) feel that their work activities interfere with their non-work activities; only five feel that their non-work activities interfere with their work activities – the remaining 19 reported no interference. Table 3 shows a summary of participants' beliefs about the nature of the interference.

Table 3: Interference between Work and Non-Work Activities

Statements	Average values
Interference of work activities on non-work activities	3.31
Interference of non-work activities on work activities	1.76

Participants who completed the questionnaire were asked to complete two diaries. One diary was designed for a week day and the other one for a weekend day. Participants were instructed to record all their mobile use activities for a typical week day and weekend day. For each activity, participants had to specify the location where it was performed, people surrounding them while the activity was performed as well as the time of the day and the duration of the activity. In addition, participants were asked to indicate the mobile device and the application used. Overall, we received completed diaries from 59 participants.

After evaluating the recorded activities, we decided to exclude the diaries from two participants. One was excluded because she omitted reporting the time spent on mobile devices during weekend. The other one was excluded because his use of mobile devices was deemed negligible (just one activity) by the research team. A further inspection of the remaining 57 sets of diaries revealed

that the way some participants were using their devices did not match the 'mobility' characteristic, which is the focus of this study. Some participants reported that they were using their mobile devices, especially laptops, for extended periods (e.g., one participant reported eight continuous hours of mobile device usage). This kind of activities unequivocally did not represent the essence of mobile computing. As a result, we excluded these activities from eight participants in our analysis.

Next, we describe our analytical procedures, which allowed us to discover different patterns of use. Then, we discussed the results of the mutual interaction between spatiotemporal meanings and mobile device use.

ANALYSIS AND DISCUSSION

We began our analysis by examining mobile use that participants wrote in their diaries to identify patterns of mobile-enabled activities. On a typical week day, participants reported the amount of mobile use from 2min to 5h49min with an average of 2h3min. On a typical weekend day, participants reported the amount of mobile use participants from 17min to 9h15min with an average of 2h21min. We found that 24 participants spent more time using their mobile devices during a week day than during a weekend day and 33 spent more time using their mobile devices during a weekend day than during a week day.

Next, we examined mobile use across time and space. We paid attention to work time and non-work time as well as different spaces including office, home and other places. We used the 9-to-5 model on a week day to delineate work time (Nippert-Eng, 1996). Non-work time includes those hours outside of 9-to-5 on a week day and all hours on a weekend day. On average, participants spent more time using mobile devices from home for both week and weekend days. On a week day, participants use mobile devices on an average of 40min at office, 64min at home and 20min at other places. On a weekend day, participants spent

an average of 129min and 14min using mobile devices from home and other places, respectively.

We coded mobile enabled activities into work (e.g., taking meeting notes, checking work-related emails) and non-work (e.g., downloading recipes, reading news) activities. Figure 1 presents the aggregated number of work activities from all participants during non-work time from office, home and other places. Work and non-work times are socially constructed and have shared meanings to imply appropriate use of time and activities (Nippert-Eng, 1996). According to social conventions, work time should be used to conduct work activities and non-work time should be used for personal purposes. In the same way, office and home are socially constructed spaces with arbitrary boundaries (Zerubavel, 1991).

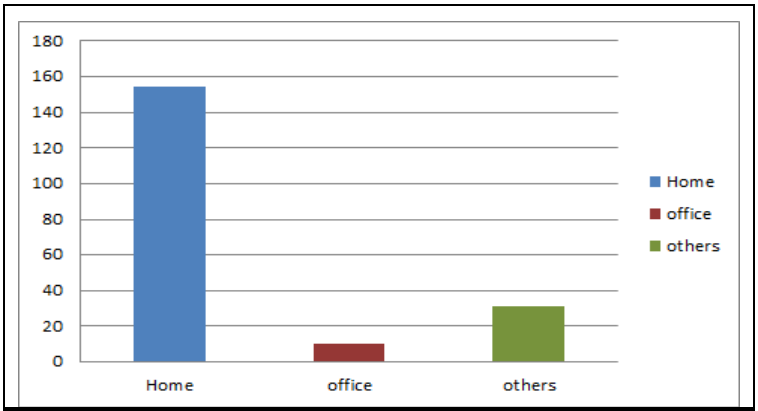

Figure 1. Work Activities during Non-work Time

The data clearly shows that participants, through their mobile use practices, modify the spatiotemporal meanings of what is ‘office’, ‘home’, ‘work time’ and ‘non-work time’. Mobile use practices sculpt the shapes of work time and non-work time. Work time is stretching into non-work time, shrinking the non-work time as a result. Brannen (2005) used the term ”extended present” to describe this phenomenon. The constant connectivity to work that is enabled by mobile devices also transforms the conceptual and experiential meaning of home. This change can be explained through the concept of frames. We use frames to guide and provide meaning to our actions in the world. Frames are activated as “ways

of thinking and being... that imbues otherwise subjectively meaningless places, things, times of day...” (Nippert-Eng, 1996, p. 26). It appears that mobile devices quietly put participants into a sense of self that is associated with ways of thinking and being “workers” during non-work time and outside office.

Next, we calculated the average amount of time that participants used mobile devices at office, home and other places on a week day and a weekend day. These average values were used as proxies to classify participants into two groups: those with above average and below average usage time. We identified eight groups for week days and four groups for weekend days – see Table 4.

Table 4: Different patterns of mobile use

	Group ID	Group characteristics	Group size
Week day	G01	AA: office, home & others	2
	G02	AA: office / BA: home & others	10
	G03	AA: home / BA: office & others	12
	G04	AA: others / BA: office & home	5
	G05	BA: office, home & others	15
	G06	BA: office / AA: home & others	4
	G07	BA: home / AA: office & others	5
	G08	BA: others / AA: office & home	4
Weekend day	G09	AA: home & others	3
	G10	AA: home / BA: others	19
	G11	BA: home & others	29
	G12	BA: home / AA: others	6

AA: above average; BA: below average

This classification allowed us to identify participants from each group for semi structured in-depth interviews. In total, we interviewed 11 participants. Table 5 shows the number of interviewees from each group.

Table 5: Interviewees by Group

	G01	G02	G03	G04	G05	G06	G07	G08
Number of participants	2	2	2	1	1	1	1	1

The overlap between participants in the week day and weekend day groups should be noted. For example, one participant belonging to any of the eight week day groups also belongs to one of the four weekend day groups. The eleven

participants that we selected above include one participant from G09, three from G10, five from G11 and one from G12.

Before conducting the interview, we revisited the participant's questionnaires and diaries in order to prime ourselves. Two members of the research team conducted the interviews individually with the participants. The interviews, which lasted between 37min and 1h11min were audiotape recorded with the consent of the participants. As part of the interview protocol, participants were asked to write down as many words or phrases that reflect their mobility experience and their feelings towards their mobile computing devices.

The analysis of the interviews followed a deductive, inductive and abductive process (Reichertz, 2007). The deductive reasoning was informed by the extant literature reviewed earlier, which not only guided us in the elaboration of the questionnaire and diaries but also contributed to enhance our theoretical sensitivity for the problem at hand (Glaser, 1978). The inductive logic led the bottom-up coding procedure (computer assisted by NVivo), by which we purposively put existing theoretical approaches aside to see the data with fresh eyes and open mind (Glaser, 1992). An initial analysis of the interviews produced 63 initial codes and 16 focused codes. The abductive reasoning allowed us to elaborate on an explanation of how users' spatiotemporal meanings of both work and non-work domains are shaped by mobile computing technologies. This explanation was contrasted against the reviewed literature.

Mobile computing device use and the shaping of spatiotemporal meanings

Participants use mobile devices for a number of activities. The non-work activities are as diverse as their interests. The wide range of activities go from organising camping trips, reading e-books, planning marathons, grocery shopping, listening to the music, booking restaurants, blogging, taking photos, playing games, looking up recipes and reading/watching the news to using GPS

to drive around, keeping track of gym workout, cheating when doing crosswords and even using the device as a mirror. Mobile devices are also used as gadgets for breaking dullness; one participant calls his iPad a “boredom reliever”. For instance, he says that he watches previously uploaded videos while travelling or waiting at doctor’s office. Another one says, “[I use it to] check Facebook while I am on the ferry… just because I have it”. Some others express their reliance on mobile devices for their everyday activities: “They have become part of our lives” and “I would be lost without them”.

However, email is the dominant application in our participants’ mobile experiences. As one participant emphasises, “The only thing that I think has changed since I have been using the work iPad is that I am more connected with what is happening in terms of email… every time I open it I see those notifications”. And it is the access to email messages through mobile devices that is altering the spatiotemporal meanings of work and non-work.

The fact that every one of our 57 participants reported using MS Outlook (the institutional email application) on their mobile devices reveals that work-related communication and the actions it prompts are almost inescapable. Except for the three participants who use mobile devices solely during office hours, all the rest begin using their devices before office hours and continue using them during office hours, or start using them during office hours and continue using them after office hours or – the most common occurrence – use their mobile devices all the way throughout the day. As is expected, the use of mobile devices for work activities occurs from non-work spaces – e.g., “I check my email just about every five minutes if I am out of my office” – and at non-work times – e.g., “I get emails… at really odd times”.

The previous discussion indicates that the presence of mobile devices is an invitation to use them in the spatiotemporal domain where otherwise they would

not be used. One participant explains that before she got the iPad she did not check emails frequently, but now "it is so easy… It is a big incentive to use it". Another participant highlights her perceived advantages of mobile devices: "It is more convenient. Now, I can work from anywhere; catching up on work". These are instances that suggest that the use of mobile devices contributes to the transformation of the conventional interpretations of non-work space and non-work time. In this sense, mobile technology represents spatiotemporal boundary objects (Ancona, Okhuysen, et al., 2001) that facilitate the transition and coordination across temporal zones – i.e., from non-work to work. To some extent, mobile technology is facilitating the transition of timing norms of the organisation and its members into a fast-paced rhythm of work through the interaction with the absent others. As a result, work is continuously extended.

Table 6 presents a list of selected participants' quotes that illustrate this change.

Table 6: Participants' Quotes

- "I check emails everyday [including weekends]… otherwise they build up and they come from all over the world, not only during office hours. I like to keep on top of them… I do not want to spend much time on a work day dealing with them… Work is 24/7 really".
- "iPad is sitting on my lap [while watching TV], so I can feel when emails are coming in".
- "In the morning, I get up then I check… my email… if I am expecting something. Or even if I am not expecting anything, I just check my email… It is such a habit".
- "I check emails quite often… including at traffic light stops just to know what is going on".
- "I do not have to waste time when I am at the office [anymore]… Now, when I come to office, I already know all emails in my inbox… It takes 20 seconds to read an email when I am on the bus".

When participants were asked to describe their experience with their mobile devices, they all used positive terms. Words such as "portable", "convenient", "accessible" and "easy to use" among others were mentioned. However, there were also expressions that hide the negatives in these positive ideas – e.g., "24/7 available" and "[being aware of] what will happen next work day". The evidence suggests that participants are – to a greater or lesser degree – using the device, as one of them say, "to be on top of things". It is the very characteristics of portability, convenience, accessibility and easiness to use that makes the device an almost invisible intruder into people's living rooms,

bedrooms or cars at times that otherwise would be non-work time. Moreover, the devices are welcomed as work partners that could help individuals enhance their work performance.

The pervasiveness of mobile technology makes the notion of personal time and space fuzzy. Individuals do not only accept bringing work home after they leave the office but also being available for work. One participant elaborates that there is no "transition between office hours and home hours" for her and many others too:

> "Sometimes email arrives on a Saturday morning from somebody that I work with. They are not expecting me to respond straightaway, but I do respond. And I find they are sitting there and reading my emails. And they do respond again. So, it is not only me… It is just that for some people it has become OK to communicate after hours with work related issues".

Spatiotemporal meanings and the shaping of mobile computing device use

Not only does the use of mobile technology shape individual interpretations of time and space, but also the use of mobile devices is also shaped by spatiotemporal interpretations in a recursive fashion. Observing how the new spatiotemporal meanings shape the use of mobile devices is a challenge since, by the time we started this research, our participants already had a history spanning many years of mobile experience. It is difficult for them – and for us too – to imagine a world without such technology. As one participant reflects, "It is really hard to think back how you did things before you had mobile devices. I used to carry my diary with me everywhere. Now, I do not have my diary anymore".

The new interpretations of space and time are redefining the way mobile devices are being used. Non-work space (e.g., home) and non-work time (e.g., weekends) are slowly yet increasingly filled with work activities. This plodding erosion of non-work space and non-work time stimulates the use of mobile

technology for work activities. The combined effect of a weakened notion of non-work space and non-work time along with the perceived need of 'being always available' through mobile devices shapes the use of this technology for work related activities – cf. Gergen's (2002) "perpetual connection". As one participant reflects, "I am not a freak person who wants to [keep working all day long]. I get sick of it. I feel sorry of myself sometimes, but this is my job. I just have to keep doing it."

The cyclical nature and the physical proximity of work activities that characterised agricultural societies make any attempt to define the boundaries between work and non-work realms a futile enterprise. Farm duties define people's lifestyle; work and non-work are blended in their spatiotemporal understanding. Later on, it was the industrial life what brought a clear spatiotemporal demarcation between work and non-work domains (Thompson, 1967). The transformation of industrial work into informational work accompanied by the introduction of mobile technology has blurred the boundaries between work and non-work reverting us back to the characteristics of agricultural societies (Castells, 2000). However, unlike agricultural societies, where independent work was the predominant form of employment arrangement, individuals are, for the most part now, members of an organisation with its own set of IT-supported processes for the attainment of its goals.

The spatiotemporal notion that should distinctively separate work and non-work dimensions has disappeared. Individuals are now trying to catch up with the organisational rhythm. Consequently, they find mobile technology as an invaluable tool to stretch time into non-work spaces in order to accomplish their work responsibilities. The explanation one participant gives reveals the downfall of spatiotemporal boundaries, "When I go home, it is still work hours in Singapore, morning in the US… So my colleagues carry their work and contact

me… I prefer not to wait until the next day to get back to them because it delays the whole interaction… They reciprocate… It is the normal working in the academia… We are more efficient".

Social pressures make the spatiotemporal boundaries between work and non-work undistinguishable. In order to be "on top of things" and to meet the absent others' expectations individuals struggle to manipulate time through the use of mobile devices. Individuals, regardless of their physical location and temporal situation, strive to be always available. The experience of one participant serves to illustrate this observation. She explains that she felt compelled to acquire her first smartphone a few years ago because she missed an email from the dean while she was attending a conference overseas. "I was embarrassed [for not replying that email]", she recalls. Another example is given by a participant who emphatically asserts that he checks work email while on holiday overseas, even if he has set up an automatic email reply: "If it is easy to reply, I do reply… You get good feedback… They know that you are out of the country and you still reply. "Oh! Thank you!" That makes me feel good". These instances reflect how individuals are predisposed by socially constructed spatiotemporal interpretations of work to use mobile technology for interacting with the absent others.

The construed meaning of time induces individuals to adjust their personal time to organisational time. Similarly, the work space is overstretched and now extends beyond the office. Work demands penetrate so deeply into our participants' interpretations of time and space that mobile devices are perceived as redeeming tools for engaging with their work responsibilities. One participant reflects that when she leaves office in the afternoon, there is still some work lingering in her mind, so she occupies the one-hour train commute on her way home to continue working on her mobile device. Another one uses the

expression of being “engrossed (banging into walls)” to explain his feeling of immersion when he uses mobile devices.

Even the very same understanding of what constitutes work – and where and when it needs to be done – is entirely open to new interpretations. These different interpretations are heavily influenced by organisational non-written norms. For instance, some participants consider work emails as a soft kind of work activity. One of them oxymoronically elaborates, “I try not to do work other than email. I tend not to do real work outside the office”. This perception of space and time, which shapes how mobile technology is used, is echoed by other participants as shown in Table 7.

Table 7: Participants’ quotes

- “The expectation now is higher since you have the mobile devices… So, probably [my iPad] dictates a little bit on me that I have to be on top of things… I have to use it outside work”.
- “Checking emails is the first thing I do in the morning and also it is the last thing of the day I do... I do not want to miss anything”.
- “In the evening, the only work thing that I do would be checking email and responding to email”.
- “I feel quite anxious about emails from work on the weekend”.
- “I do not have to waste time when I am at the office… Now, when I come to office, I already know all emails in my inbox… It takes 20 seconds to read an email when I am on the bus”.
- “I try not to use it to do work during the weekend. Occasionally, I will do work”.

Even though our participants are willingly always available for work demands, they still exercise their agency. Within the constraints imposed by the dominant social norms, they selectively use mobile devices to moderate their availability for work. When explaining how they act upon email communications depending on urgency – e.g., “If I feel it needs a reply… I will do it. But if something is not urgent, I would not do it” – communication partner – e.g., “If it is from a student [out of office hours], I will not respond because I do not want to [be] available 24/7 for students” – interests – e.g., “I check all my emails… If the email is related to research, it does not have to lie within the boundary of 8-to-5 job… It is just of your interest.”

Emerging perceptions of mobile computing experiences

The daily use of mobile technology engenders somewhat conflicting perceptions on its users. Our analysis reveals two emerging perceptions: unsolved controversies and accommodating attitude.

The perception of unsolved controversies refers to enduring contradictions in the use of mobile devices. This is true even for the participant who seems to be the least interested in doing work related activities in her personal space and time. Although she vigorously states she would “definitely not” use mobile devices for work-related activities outside office hours. In the course of the interview, she admitted that every now and then she receives texts from her manager outside office hours. “If I get a text from her, I do know that the issue deserves my attention. I act upon [her request]”. The words of one participant epitomises another instance of unsolved controversies: “I like it and hate it at the same time”.

Accommodating attitude represents a sense of resignation from mobile users. They acquiesce to the consequences of integrating mobile technology into their lives. Because of the socially enacted spatiotemporal meanings and the capabilities of mobile devices, individuals exhibit a relatively high degree of tolerance. One participant justifies the erosion of his personal space and time: “I think it takes time away of my non-work life, but it is not necessarily a bad thing because I can keep track of things… I still have time for my family”. Another participant exudes a sense of surrendering to a new life with mobile devices: “Because you have the push notifications… you do not have a choice… I think we tend to get used to it a little bit after a while”. There is a generalised perception that not being available is inconceivable as long as the organisational clock is ticking.

CONCLUSION

When we initiated this study, we did not have any preconception on the nature of the interference between work and non-work activities. Although the reviewed literature told us that work activities are eroding personal lives, we went to the field with an open mind. Later, our findings confirmed that the interference is predominantly from work to non-work realms. Our goal was beyond analysing the direction of this interference. Our objective was to understand the nature of the mutual shaping of mobile use and interpretations of spatiotemporal meanings.

Despite the fact that mobile devices are multifaceted tools, we discovered that email communication is the dominant activity that shapes the use of mobile devices and the interpretations of space and time. This finding provided the starting point for the subsequent analysis. The scrutiny of our data reveals a mutually influential phenomenon by which spatiotemporal meanings are shaped by the use of mobile devices and the use of these ones is shaped by the changing spatiotemporal meanings. The collective use of mobile devices as spatiotemporal boundary objects facilitates the speeding up of timing norms of the organisation into an ever faster rhythm of work, making the demarcation between work and non-work blurry. Simultaneously, the weakening notion of non-work space and time reinforces the perceived need of employees to be always available. The combined effect of these two mutually shaping conditions increases the use of mobile devices for work-related activities.

The changes mobile devices have introduced in work habits are sticky. Participants have been captivated by the appealing yet intrusive technological sublime. That is why our participants do not resist continuing working from non-work spaces on non-work times. The intricacy of spatiotemporal interpretations and mobile use engenders complex and somewhat conflicting perceptions on

users. As a consequence, living with mobile devices provokes two different evolving perceptions of mobility experience: unsolved controversies and accommodating attitude. Unsolved controversies reflect the intertwined paradoxical tensions with positives and negatives of being always available. Accommodating attitude refers to users' acquiescence to reluctantly allow work to blend into the non-work domain via mobile devices.

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