



**Managing Work-Life Boundaries with Mobile Technologies:
An Interpretive Study of Mobile Work Practices**

Journal:	<i>Information Technology & People</i>
Manuscript ID:	ITP-08-2013-0155
Manuscript Type:	Article
Keywords:	Affordances, Mobile systems, Interpretivist research, Case Study

SCHOLARONE™
Manuscripts

Review

MANAGING WORK-LIFE BOUNDARIES WITH MOBILE TECHNOLOGIES: AN INTERPRETIVE STUDY OF MOBILE WORK PRACTICES

ABSTRACT

Purpose:

We explore the role that mobile technologies play in mobile workers' efforts to manage the boundaries between work and non-work domains. Previous theories of work-life boundary management frame boundary management strategies as a range between the segmentation and integration of work-life domains, but fail to provide a satisfactory account of technology's role.

Design/methodology/approach:

We apply the concept of affordances, defined as the relationship between users' abilities and features of mobile technology, in an interpretive field study of 25 mobile workers who used a variety of mobile devices and services over two different time periods.

Findings:

Our results demonstrate that the material features of mobile technologies offer five specific affordances that mobile workers use in managing work-life boundaries: mobility, connectedness, interoperability, identifiability and personalization.

Originality:

We found that mobile workers' boundary management strategies do not fit comfortably along a linear segmentation-integration continuum. Rather mobile workers establish a variety of personalized boundary management practices to meet their particular situations. We speculate that mobile technology has core material properties that endure over time. We surmise that these core mobile material properties provide opportunities for users to interact with them in a manner to make the five affordances possible. Therefore, in the future, actors interacting with mobile devices to manage their work life boundaries may experience affordances similar to those we observed because of the presence of the core mobile material properties.

Keywords:

Technology Affordances, Work-Life Boundary, Case Studies, Interpretive Research, Materiality, Mobile Computing, Work-Life Studies

INTRODUCTION

The pervasiveness of mobile computing devices and services has generated numerous projections for the growth of the mobile workforce. The International Data Corporation (IDC) estimates that the worldwide mobile worker population will increase from just over one billion in 2010 to more than 1.3 billion by 2015 (IDC 2012). Increasingly, companies are implementing “bring your own device” (BYOD) initiatives which allow employees to bring their personal electronic devices to work for business use. These trends reflect increased opportunities for mobile workers to use mobile devices for both work and personal activities.

Consistent with prior research, we define mobile technology as lightweight, mobile IT artifacts “that encompass hardware (devices), software (interface and applications), and communication (network services)” (Jarvenpaa, Lang and Tuunainen 2005, p. 8). Over the past decade, mobile devices include mobile phones, pagers, smart phones, personal digital assistants (PDAs), laptop computers, tablet computers, handheld computers and navigation systems (Tarasewich and Nickerson 2002; Varshney and Vetter 2002). Moreover, we concur with Jarvenpaa et al. that it is difficult to separate mobile devices from mobile computing services such as email. As Jarvenpaa et. al note, “because they are so intertwined, it does not make sense to disentangle device, interface, and applications when studying how mobile services create value for users” (2005, p. 8). Because new devices and services continue to be developed and marketed, definitions that refer to specific products or services are not likely to endure. Thus, our more general definition includes not only existing IT artifacts but also those that may become available for future use.

By enabling work that is freed from geographical and temporal constraints, mobile technologies are associated with potential increases in individual and organizational productivity. Workers may increase individual productivity by working during periods formerly spent at home or while traveling. Organizations may also benefit from the ability to access mobile workers who

1
2
3 are traveling or working from remote sites. Empirical studies associate the use of mobile
4 technologies with improved work-life balance (Govindaraju and Sward 2005).
5
6

7
8 Despite such positive outcomes, concerns can be raised regarding the social
9 consequences of mobile technologies. One danger is that work that can occur “anytime,
10 anywhere” may become work “all the time, everywhere,” thereby removing time for nonwork
11 activities (Davis 2002). As a result, workers may experience deterioration of communication,
12 office and personal relationships, and work productivity (Middleton and Cukier 2006;
13 Prasopoulou, Pouloudi and Panteli 2006; Quesenberry and Trauth 2005) and increased job stress
14 (Ahuja et al. 2007; Tietze 2002). Moreover, mobile workers may lose control over boundaries
15 between work and personal activities (Jackson, Gharavi and Klobas 2006).
16
17
18
19
20
21
22
23
24

25 The social issues surrounding mobile computing are part of a broader discourse on work-
26 life boundaries, which also reflects both positive and negative views. Much research in human
27 resource management emphasizes the negative consequences of blurring work-life boundaries
28 (Ashforth, Kreiner and Fugate 2000; Clarke 2000; Duxbury, Higgins and Mills 1992; Perlow
29 1998; 1999). However, the literature also includes more positive views. For example, Greenhaus
30 and Powell (2006) argue that work and family commitments do not necessarily conflict and that
31 positive experiences in one role can enrich experiences in the other role. Thus paradoxically, prior
32 research suggests that mobile technology may be implicated in both the disruption of work-life
33 balance (Mazmanian, Orlikowski and Yates 2005; Middleton and Cukier 2006; Prasopoulou et al.
34 2006) and the restoration of work-life balance (Scheepers, Scheepers and Ngwenyama 2006).
35
36
37
38
39
40
41
42
43
44
45

46 This paper contributes to this discourse by reporting on a study of mobile workers’ use of
47 mobile technologies to manage their work-life boundaries. We address the research question:
48 *How is mobile technology implicated in the work-life boundary management practices of mobile*
49 *workers?* We studied 25 mobile workers who used a variety of mobile computing devices. We
50 use the concept of affordances, defined as the relationship between users’ abilities and features of
51 mobile technology, to extend existing theory on work-life boundary management by identifying
52
53
54
55
56
57
58
59
60

1
2
3 specific affordances that enable management of the physical, temporal and psychological
4
5 boundaries between work and non-work domains.
6

7 We begin by reviewing previous literature in two areas: (1) work-life balance and
8
9 boundary management practices, and (2) mobile technology affordances and work-life boundary
10
11 management. We then describe the research method, report our findings, and discuss our
12
13 theoretical contribution. Our conclusion addresses the limitations of our study and suggests areas
14
15 for future research.
16
17

18 **WORK-LIFE BALANCE AND BOUNDARY MANAGEMENT PRACTICES**

19
20 Streams of research on work-life balance, the management of work-life boundaries, and
21
22 organizational policies that enable work-life balance developed well before the advent of mobile
23
24 information technologies, yet they remain relevant to our research purpose. The primary issue
25
26 addressed in the literature on work-life balance is the interference of work with family, which is
27
28 typically viewed as a source of psychological distress for workers. Work-life balance is conceived
29
30 as a desirable state of psychological well-being in which conflicts between work and family are
31
32 either resolved or avoided (Greenhaus and Beutell 1985; Kreiner, Hollensbe and Sheep 2009).
33
34 Work-life boundary management includes strategies and tactics for achieving work-life balance,
35
36 by either strengthening or weakening boundaries between work and other life domains.
37
38 Unmanaged boundaries may induce ambiguity regarding role expectations and increase role
39
40 conflict, leading to difficulties in fulfilling role requirements in both work and personal domains
41
42 (Major, Klein and Ehrhart 2002).
43
44
45

46 Unfortunately, the notion of work-life balance is problematic because it fails to separate
47
48 three distinct theoretical ideas: boundary management, psychological responses, and individual
49
50 preferences. Accordingly, Grzywacz and Carlson (2007) propose to distinguish the concept of
51
52 work-life balance from the boundary management activities that promote the desired goal of
53
54 balance, or psychological well-being. Moreover, the state of work-life balance depends upon
55
56 individual preferences for establishing and maintaining boundaries between work and other life
57
58
59
60

1
2
3 domains (Desrochers, Hilton and Larwood 2005; Moen, Kelly and Huang 2008). Empirical
4
5 findings show that organizational policies designed to enable work-life balance may not meet all
6
7 workers' expectations equally (Rothbard et al. 2005). For these reasons, our focus is upon work-
8
9 life boundary management rather than work-life balance.
10

11
12 The study of work-life boundary management is based in work-family border theory
13
14 (Clarke 2000) and work-life boundary theory (Ashforth et al. 2000; Nippert-Eng 1996), which
15
16 emerged simultaneously to explain how individuals manage both work and family life domains
17
18 (Bulger, Matthews and Hoffman 2007). Clarke (2000) defines borders, or boundaries, as the lines
19
20 of demarcation between work and family domains that specify where domain-specific behavior
21
22 begins and ends. Borders may be defined in physical, temporal and psychological terms (Clarke
23
24 2000). A physical border defines *where* domain-relevant behavior takes place; a temporal border
25
26 defines *when* domain specific behavior takes place; and a psychological border consists of *social*
27
28 *rules* that specify the cognitive, behavioral and emotional states that are appropriate for particular
29
30 domains.
31
32

33
34 Boundary management, or boundary work, refers to the strategies and tactics used to
35
36 establish, maintain and modify social distinctions between work and family (Nippert-Eng 1996).
37
38 Boundary management may involve behavioral tactics that involve other individuals or
39
40 technologies, temporal tactics that determine when work and other activities are performed,
41
42 physical tactics that regulate spatial distances between work and other activities, and
43
44 communicative tactics that set expectations for other domain members (Kreiner et al. 2009).
45
46 Social boundaries may vary in strength depending on their degrees of permeability and flexibility
47
48 (Bulger, Matthews and Hoffman 2007). Permeability refers to the extent of interruptions by one
49
50 domain in another, while flexibility refers to the capacity of individuals to relax a boundary.
51
52 Strong boundaries are less permeable and less flexible than weak boundaries. While strong
53
54 boundaries separate domain activities, weak boundaries allow both work and personal domains to
55
56
57
58
59
60

1
2
3 blend, or blur, in a “borderland” that includes activities from multiple domains (Clarke 2000;
4
5 Desrochers et al. 2005; Greenhaus and Powell 2006; Nippert-Eng 1996).
6

7
8 Boundary management strategies may be viewed along a continuum between extreme
9
10 integration and extreme segmentation of life domains (Ashforth et al. 2000; Nippert-Eng 1996;
11
12 Tietze 2002). When personal and work domains are fully integrated, no distinction is made
13
14 between activities that belong to either home or work, or where and when activities should occur.
15
16 Blending work and personal activities may allow actors to achieve equal attentiveness and
17
18 connection with valued activities regardless of their domain of origin (Morris and Madsen 2007).
19
20 By contrast, when home and work domains are completely segmented, the boundary between
21
22 domains is clear and unchangeable. Segmenting work-life domains allows actors to focus
23
24 exclusively on one domain or another (Major et al. 2002).
25
26

27
28 All boundary work requires attention to role transitions. Ashforth et al. (2000) focus on
29
30 micro role transitions and assume that actors apply a mix of segmentation and integration
31
32 strategies to minimize the cost, or difficulty, of role transitions. In segmentation strategies, actors
33
34 may engage in rites of passage when moving across the boundaries between roles. By contrast,
35
36 integration strategies may involve fewer symbolic shifts and be executed with little psychological
37
38 or physical effort. However, integration requires more frequent micro role transitions than
39
40 segmentation and therefore risks the negative consequences of blurring role distinctions.
41

42
43 Recent research has challenged the integration-segmentation continuum on empirical
44
45 grounds (Bulger et al. 2007; Golden and Geisler 2007; Hislop and Axtell 2011; Kreiner et al.
46
47 2009; Moen et al. 2008). Empirical studies suggest that boundary management may involve
48
49 separate strategies applied within each relevant domain (Bulger et al. 2007; Powell and
50
51 Greenhaus 2010). For example, a segmentation strategy may be applied at home to prevent work
52
53 interference, while an integration strategy may be applied at work to facilitate family interference
54
55 and other social activity (Hislop and Axtell 2011). Other research suggests that boundary
56
57 management strategies fall into qualitatively distinct clusters that may evolve over individuals’
58
59
60

1
2
3 lives (Moen et al. 2008). Thus, rather than choosing boundary management strategies along a
4 continuum ranging from segmentation to integration, individuals may vary practices depending
5 on their ability and willingness to employ integration and segmentation strategies (Bulger et al.
6 2007; Kreiner 2009).
7
8
9

10
11 Although cognizant of the relevance of mobile technologies, studies of work-life
12 boundary management tend to neglect full consideration of information technologies (Boswell
13 and Olson-Buchanan 2007; Cousins and Robey 2005; Hill, Hawkins and Miller 1996; Kreiner et
14 al. 2009; Richardson and Benbunan-Fich 2011; Senarathne Tennakoon, da Silveira and Taras
15 2013). To compensate for this neglect, we turn next to a review of empirical studies of mobile
16 technology affordances and work-life boundary management.
17
18
19
20
21
22
23

24 **MOBILE TECHNOLOGY AFFORDANCES AND WORK-LIFE BOUNDARY** 25 **MANAGEMENT** 26 27 28

29 The concept of affordance is frequently applied in the field of human computer
30 interaction as a means of guiding computer interface design (Norman 1988). The concept is also
31 increasingly used to explain how the material properties of artifacts, including mobile technology,
32 influence the ways that artifacts are used (Arnold 2003; Baron 2008; Leonardi and Barley 2008;
33 Leonardi, 2011; Ling 2004; Markus and Silver 2008; Orlikowski 2010; Robey, Anderson and
34 Raymond 2013). Acknowledging the materiality of artifacts helps to overcome tendencies either
35 to neglect technology completely or to theorize technology from a purely interpretive perspective,
36 for example as “text” (Hutchby 2001).
37
38
39
40
41
42
43
44
45

46 We adopt a relational view of affordances, which we understand as the relationship
47 between physical artifacts and their social contexts of use. Although Gibson (1979) originally
48 coined the term affordance to refer to invariant characteristics of physical objects, later debates in
49 ecological psychology and technology studies have positioned affordances as a characteristic of
50 the *relationship* between objects and actors (Chemero 2003; Ling 2004; Markus and Silver 2008;
51 Robey et al., 2013; Stoffregen 2003). Defining affordances as relationships averts the need to
52
53
54
55
56
57
58
59
60

1
2
3 specify affordances in terms of a potentially limitless set of material properties, which for mobile
4 technology would change each time new artifacts appeared. A relational approach resonates with
5 Orlikowski and Scott's (2008) arguments about sociomateriality as "mutually dependent
6 ensembles," which treats actors and objects as interdependent systems. Although treated as a
7 sociomaterial concept, affordance preserves the ontological distinction between social and
8 material phenomena. Affordances are seen as potentials for action that depend on both the
9 material properties of objects and the ability of actors to perceive and use them. Material
10 technologies thus become necessary conditions for affordances, but are not the affordances
11 themselves (Markus and Silver 2008).
12
13
14
15
16
17
18
19
20
21

22
23 However, existing classifications of affordances found in the literature (e.g., Arnold
24 2003; Treem and Leonardi 2012; Zamutto et al. 2007) have little in common, suggesting that a
25 finite set of affordances should not be defined a priori. Rather, novel affordances are likely to
26 arise depending on the organizational context of specific technology applications (Jonsson,
27 Holmström and Lyytinen 2009; Pollock et al. 2009). Nonetheless, studies of mobile technology
28 use show that affordances have been classified under three broad themes: mobility, identifiability
29 and connectedness. While the studies that we draw upon to generate these themes lack the
30 precision we seek in applying the concept of affordances, they do provide a starting point for
31 theorizing about the affordances of mobile technologies in practice.
32
33
34
35
36
37
38
39
40
41

42 *Mobility.* We define mobility as the user's potential to move freely across space and time
43 while engaging with a mobile device. The user's engagement with mobile technology's features
44 such as its size and weight and its access to synchronous or asynchronous services in widely
45 geographically dispersed locations create opportunities for the user to carry devices anywhere.
46 Complex communications technology within the mobile device affords the movement without
47 losing the capacity for voice exchange, mobile collaboration, communication and execution of
48 commercial transactions. Mobile workers can be office based yet use mobile technology while
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 traveling to customer locations and satellite offices as well as in unconventional work spaces such
4
5 as coffee shops, airports, trains, cars and airplanes (Laurier 2001).
6

7
8 Kristoffersen and Ljungberg (2000) classify mobile worker's mobility as traveling,
9
10 wandering and visiting. Traveling is going from one place to another in a vehicle, for example, an
11
12 airplane trip from one city to another. Wandering, by contrast, is a form of local mobility where
13
14 an individual walks around for a considerable amount of time. Third, visiting refers to stopping at
15
16 a location and spending time there before moving to another location. As users engage in the
17
18 forms of mobility, they may also engage in place making, which Brown and O'Hara (2003)
19
20 define as the practice of using, managing and manipulating physical space to support mobile
21
22 computing activities. Place making can assume different forms, including cocooning and
23
24 encampment (Ito, Okabe and Anderson 2009). Cocooning involves using mobile devices to
25
26 shelter users from active engagement with physical surroundings; encampment involves using
27
28 portable media to construct personal work spaces in public places such as cafés and libraries.
29
30

31
32 *Identifiability:* Mobile technology gives users the potential to associate a mobile device
33
34 or service with a single authorized individual, thus allowing the user to represent a unique
35
36 identity. Identifiability is made possible through use of material features such as the subscriber
37
38 information modules (SIM) card in mobile phones to which a unique phone number linked to the
39
40 mobile user is assigned. Other features facilitating identifiability include unique PIN codes, to
41
42 uniquely identify the device and user. On laptops, unique user name and passwords used on
43
44 mobile applications facilitate identifiability.
45

46
47 Two practices related to identifiability are self-presentation and distant mobile co-
48
49 presence. In self-presentation, users can make their behaviors, knowledge, preferences and
50
51 network connections visible to others as they move. Distant mobile co-presence (Arminen 2009;
52
53 Ling 2008; Towers et al. 2006) is the practice of occupying physical space and virtual space
54
55 simultaneously. Creating mobile distant co-presence displaces mobile workers from their physical
56
57 environments by focusing attention elsewhere, a phenomenon described by Gergen (2002) as
58
59
60

1
2
3 “absent present.” Self-representations and distant mobile co-presence may become part of a
4 user’s boundary management strategy (Baron 2008), for example in novel practices such as
5 mobile parenting and mobile learning (Arminen 2009).
6
7
8

9
10 *Connectedness.* Connectedness affords users rapid access to and constant communication
11 with other users so that multiple aspects of the mobile worker’s life can be connected (Palen
12 2002; Lal and Dwivedi 2009). Mobile technology such as phones, email and instant text
13 messaging supports both integration or segmentation strategies by making them available at times
14 and in places that once preempted such communication (Palen 2002). Extensive connectedness
15 can shift the temporal ordering between work and personal activities (Prasopoulo et al. 2006).
16 Connectedness means that mobile professionals may never disconnect from their mobile
17 technology, allowing continuous communications via mobile technology at all times. For
18 instance, free-lancers and self-employed professionals may make themselves constantly available
19 through their mobile devices so as not to lose potential work and to manage ongoing relationships
20 with clients (Sadler, Robertson and Kan 2006a). Thus, time management in mobile work is an
21 important practice involving different forms of coordinating, scheduling and managing time
22 (Nansen et. al 2010).
23
24
25
26
27
28
29
30
31
32
33
34
35
36

37
38 Connectedness may lead to multi-tasking, or the performance of multiple tasks at the
39 same time. Much of the literature on mobile multitasking is focused on the use of mobile
40 technology while driving an automobile (Laurier 2001). In a non-driving context, Sadler et al.
41 (2006b) note how mobile workers conduct phone conversations intermittently with other
42 activities. Workers may also become adept at using mobile IM and email to communicate with
43 multiple partners simultaneously while traveling (Reinsch, Turner and Tinsley 2008).
44
45
46
47
48
49
50

51 Our review of literature covering the affordances of mobile technologies reveals clear
52 interest in understanding the role of technology features to support the boundary management
53 practices of mobile workers. However, less attention has been spent on defining and theorizing
54 the concept of affordances. As stated earlier, we wish to avoid an “essentialist” position of
55
56
57
58
59
60

1
2
3 studying features while moving towards an explanation of mobile technologies that are grounded
4 in theories of affordances. As evident in most studies of mobile work practices, researchers treat
5 mobile technology in a descriptive fashion, and consequently mobile technology's implications
6 for work-life boundary management remain under-theorized. Despite this limitation, the above
7 literature helps to establish support for the relationship between affordances and work-life
8 boundary management practices, which comprises the focus of our investigation. The following
9 section describes the research methods used to answer our research question: *How is mobile
10 technology implicated in the work-life boundary management practices of mobile workers?*
11
12
13
14
15
16
17
18
19

20 21 22 23 **METHOD**

24 25 **Research Design**

26
27 Considering individuals as the units of analysis, we conducted a longitudinal, interpretive
28 study (Klein and Myers 1999) to understand how mobile workers used technology to manage
29 their work-life boundaries. We conducted qualitative interviews with 25 mobile technology users
30 who were engaged in a variety of work situations and used a variety of mobile technologies at
31 least 50 percent of the time. Based on referrals, we recruited potential subjects via email,
32 providing them with the name of the person who had referred them and an overview of the study.
33
34
35
36
37
38
39

40 We conducted an initial phase of interviews with 11 workers in 2004 and a second phase
41 with 14 different workers in 2008. The analysis in phase 1 guided data collection in phase 2. We
42 also revisited the literature between phases 1 and 2 in order to deepen theoretical insight into our
43 initial data analysis. Using two phases of data collection separated by analysis applies the
44 principle of theoretical sampling, which is a fundamental principle of qualitative research within
45 both positivist and interpretivist epistemologies (Mason 2002). The analysis across phases 1 and 2
46 allowed us to confirm results across phases, derive new theoretical insights, and increase the
47 credibility of our analysis (Miles and Huberman 1994).
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
Because four years elapsed between phases, phase 2 provided potential insights into affordances that endured despite the differences in mobile technology over the two time periods. In 2004, most of the mobile workers in our study used laptops and analog, digital and PCS cellular phones. The use of smartphones such as Blackberries and Hewlett Packard IPAQ's was just emerging. Most of the mobile workers in our sample connected to the Internet by cable modems. None of the respondents used built-in wireless modems and very few used aircards and Wi-Fi hotspots. In 2008, most respondents used laptops and smartphones such as Nokia, Blackberries and iPhones. Respondents used aircards, built-in wireless modems, 2G mobile networks and WI-FI hotspots, email, instant messenger and business and personal applications more extensively than the respondents in 2004. Thus users in 2008 had more opportunities to connect to the Internet and other mobile computing services.

27 **Data Collection**

28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
In phase 1, the first author interviewed 11 mobile workers over a period of six months in 2004. The subjects included three types of mobile computing users: six office-based workers, three home-based workers employed by organizations, and two self-employed home-based workers (See Table 1). The interview guides were based on concepts drawn from the literature on mobile work practices, e.g., the temporal, spatial and contextual conditions of mobile work (Kakihara and Sorensen 2001). We used semi-structured interviews that included questions about the background of the organization and the user, travel patterns, devices and services used, past practices, current interaction patterns and future goals with regard to technology use. The researcher also asked users how they collaborated and used technology in their personal and business lives across time, space and social context. Including two follow up interviews with one subject and one follow up interview with two subjects, we conducted a total of 15 interviews in phase 1, lasting an average of 90 minutes.

55
56
57
58
59
60
We used observation in phase 1 to supplement some of the interviews. Observations included demonstrations of mobile technologies to complement stories about their use. Because

1
2
3 interviews with participants sometimes occurred in locations away from their offices, this
4 facilitated the observation of work experiences. For instance, one respondent was interviewed at a
5 coffee shop with wireless Internet service as he installed a newly acquired wireless card. In such
6 cases, the researcher was able to grasp users' experiences firsthand.
7
8
9

10
11 In phase 2, the first author conducted telephone interviews with 14 new respondents over a
12 three month period in 2008. These mobile workers were located in different regions of the U.S.
13 and Canada and could not be observed directly. The respondents included three office-based
14 workers, nine home-based workers employed by organizations and two home-based self-
15 employed workers. Interviews conducted in phase 2 lasted 60 minutes on average (see Table 1).
16
17
18
19
20
21
22

23 All interviews except one were audio recorded and transcribed, and the unrecorded
24 interview was summarized immediately following the interview. Anonymity of all respondents
25 was ensured.
26
27
28

29 – Insert Table 1 here –
30

31 **Data Analysis**

32
33 *Phase 1.* In phase 1, we analyzed data in three rounds of coding. In the first round we
34 developed a master list of descriptive codes (Miles and Huberman 1994) based on concepts from
35 work-life theory. As shown in Appendix A, descriptive codes included physical, temporal and
36 psychological properties of border transitions; border composition processes; border flexibility,
37 permeations, crossing and keeping; the domains and place of technology use; and users'
38 effectiveness.
39
40
41
42
43
44
45

46 Using an inductive approach, the analysis also consisted of comparisons across individual
47 respondents on each of the coded categories. These similarities in the way that respondents
48 managed work-life boundaries were developed in a second round of "interpretive" coding
49 intended to combine descriptive codes into conceptual categories (Miles and Huberman 1994).
50 Interpretive codes included concepts such as managing spatial constraints, negotiating
51 accessibility and disconnection.
52
53
54
55
56
57
58
59
60

1
2
3 A third round of coding involved grouping interpretive codes into “pattern” codes
4 reflecting broader border management strategies (Miles and Huberman 1994). Pattern codes
5 represented theoretical concepts related to space utilization, managing accessibility, and
6 managing transitions. These concepts and an updated review of the literature guided the
7 development of the interview protocol used in phase 2.
8
9

10
11
12
13
14 *Phase 2.* In phase 2, we conducted three rounds of analysis. In the first round, we applied
15 the existing pattern and interpretive codes from phase 1 to the newly collected data. Our analysis
16 confirmed the codes developed in phase 1 and identified new interpretive codes. In round 2 of
17 phase 2 we organized the set of practices described by individuals into an expanded set of pattern
18 and interpretive codes. These are shown in Appendix B along with descriptions of the practices.
19 We developed a new coding category, managing time, to describe strategies that mobile workers
20 used to manage their temporal boundaries. In our analysis, text segments often reflected multiple
21 practices that, while analytically separable, were not separated in the practices explained by our
22 respondents. Thus, individual text segments could be taken as evidence of more than one kind of
23 boundary management practice. Miles and Huberman (1994) regard the multiple coding of
24 qualitative text as useful in exploratory studies where no established indexing categories exist.
25 This approach is also consistent with content analysis which recognizes that “...any one piece of
26 qualitative text is likely to address more than one topic or concept at a time” (Mason 2002, p.
27 151).
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43

44 In round 3 of phase 2, we refined our categories to produce the more parsimonious set of
45 strategies and work practices shown in Appendix C, which also provides examples from the data
46 for each interpretive coding category. It also became more evident that the material properties of
47 the technology played a central role in how users managed work-life boundaries. We therefore
48 created coding categories to index users’ references to specific affordances that were integral to
49 work-life boundary management. Although our earlier literature review identifies some ways to
50 classify technology affordances, we found them too limited because they (1) focused on a specific
51
52
53
54
55
56
57
58
59
60

1
2
3 mobile device (i.e., the mobile phone (Arnold 2003)), (2) described affordances at the
4
5 organizational rather than individual level of analysis (Zammuto et al. 2007), or (3) were too
6
7 broad.
8

9 10 **RESULTS**

11
12 Our results reveal three strategies that mobile workers apply to manage work-life
13
14 boundaries: managing physical boundaries, managing temporal boundaries and managing
15
16 psychological boundaries. As Table 2 shows, each of these strategies is comprised of several
17
18 specific practices, representing recurrent patterns of behavior enabled by the affordances of
19
20 mobile technology. The work practices and strategies are associated with five specific
21
22 affordances: mobility, connectedness, interoperability, identifiability and personalization. Three
23
24 of these are consistent with those mentioned in the prior literature review; two additional
25
26 affordances emerged from our data analysis. In the following sections, we first describe these five
27
28 affordances followed by a description of the mobile work practices that they enable.
29
30

31 ---Insert Table 2 here---

32 33 **Technology Affordances**

34
35 As shown in Table 3, we define identified five affordances reflecting the relationship
36
37 between mobile worker's perceptions and abilities and the material characteristics of the
38
39 technologies available to them.
40
41

42 ---Insert Table 3 here ---
43

44
45 All of these affordances can be illustrated in a single work practice for managing work-
46
47 life boundaries described by DV, a female Chief Operating Officer of an IT company, married
48
49 with two children and working from home. DV used a smart phone and laptop, both of which she
50
51 configured for work and family purposes. For DV, work was occasionally integrated with
52
53 physical exercise. By arranging mobile devices on the elliptical exercise machine in her home
54
55 office, she was able to attend business meetings and respond to messages while exercising.
56
57
58
59
60

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

I take a laptop and I put it on the elliptical where people usually put magazines and I remote-desktop into my computer. ...And I attend the GoToMeeting [a web conferencing application] from my elliptical. Or if I'm getting an instant message, I can get it right there while I'm on the elliptical and I can answer it right there. I'll actually take the laptop and I'll connect it to the TV and then I have a Bluetooth keyboard and so I'll just have the keyboard there [on the elliptical] and not the whole laptop. (DV)

In this example, each affordance identified in our study contributes to work-life integration. *Mobility* allowed DV to mount the laptop computer on the exercise machine for use in a non-work space, thereby increasing the flexibility of the physical boundary between home and work and contributing to work life integration. *Connectedness* is illustrated by DV's ability to use the laptop to connect to the web conferencing application via the Internet, thus increasing the flexibility of the temporal boundary by facilitating exercise during a meeting held during working hours. *Interoperability* is demonstrated by DV's use of the Bluetooth keyboard to enable connections between laptop and TV screen. This allowed her to create a personal area network to support work in a non-work space, thus increasing the spatial flexibility of the physical boundary. The *identifiability* affordance allowed DV's participation in the web conference to be authorized via her unique password. She also disclosed her work role in her IM application even though multiple roles were being performed simultaneously, thereby managing the psychological boundary. *Personalization* is demonstrated by DV's separation of IM contacts into groups (one for work, a second for family) on her laptop. This separation also enabled the management of the psychological boundary. Each of these five affordances arises from the interaction between the material properties of the technologies and the user, thus generating potential for using mobile technologies to integrate work and life domains.

Managing Physical Boundaries

Mobile workers performed work-life activities across a variety of spaces resulting in varying degrees of flexibility and permeability of physical boundaries. The two main strategies for managing physical boundaries were selecting space and configuring space.

Selecting space. Mobile technology afforded mobile workers options to select from a variety of work and non-work spaces. Selection of space could facilitate either a segmentation or

1
2
3 an integration strategy depending on the activity being performed, the spatial location, and the
4
5 time of day. Spaces in our study included vehicles (automobiles, trains, and airplanes), “camping
6
7 areas” (Ito et al. 2009) (waiting rooms, parks, and cafés), homes, and employee and client offices.
8
9

10 Managing space in vehicles began with the choice of the mode of transportation. One
11
12 practice was choosing a transportation mode that allowed a greater variety of activities (both
13
14 work and relaxation) to be accomplished while moving. For example, MG, a Microsoft certified
15
16 trainer, selected trains instead of automobiles so that he could avoid operating a motor vehicle. As
17
18 MG engaged his air card and laptop, the connectedness and mobility affordances supported the
19
20 management of his work life boundaries while on the train.
21
22

23 *I opted to take a train from New York to Vermont and the train back from Vermont to New*
24 *York just so that I can have the hours on the train to do work. ... And I found myself more*
25 *relaxed as well. (MG)*
26

27 When not inside of vehicles, mobile workers often used mobile technology to work in
28
29 camping areas such as hotel rooms, parks, cafés and airport lounges, which were converted into
30
31 spaces that could accommodate either work or personal activities. Mobile users chose public
32
33 places based on the availability of Internet access, refreshments, showers (as in the case of airport
34
35 lounges) and other resources supportive of mobile work. Even when working from their own
36
37 homes, some mobile workers carried mobile technology to nearby parks, cafés, and bookstores
38
39 when they desired a change of environment for work. Mobility and connectedness afforded the
40
41 use of the space for these purposes. For example, JM used her laptop to work at Barnes & Noble
42
43 or Starbucks stores near her home. On occasion, she also brought her smart phone along on walks
44
45 in the park with her husband so that she could work while they spent time together:
46
47

48 *Even if my husband wants to go to the park and I know I have to test a couple of things -- I*
49 *can commit to doing that because I know I can do it from my phone. (JM)*
50
51

52 Managing work-life boundaries within the space of home involved the selection of
53
54 specific rooms in which to bring mobile technology for work purposes. In DV’s case, this choice
55
56
57
58
59
60

1
2
3 led to difficulties in managing work-life boundaries because she rarely moved from the bedroom.

4
5 On some days she woke up in the morning and walked directly to her desk to check emails:

6
7
8 *So you start responding, and then you realize that you got to your desk at 6 in the morning. It*
9 *is now after midnight, you are so tired that you're gonna go get in bed. You haven't showered*
10 *or brushed your teeth or combed your hair that day. You probably used the bathroom twice.*
11 *(DV)*

12
13 To manage her space more effectively, DV moved to a different house where she dedicated one
14 room as a work area where mobile technology was predominantly used, so she "...could actually
15 close the door and put a key in the lock at the end of the day." In DV's case, mobility and
16 connectedness allowed her to use mobile technologies to strengthen the boundary between work
17 and personal activities because different activities could occur in separate rooms.

18
19
20
21
22
23
24 *Configuring space.* Mobile workers exercised discretion in choosing vehicles large
25 enough to accommodate work while driving. Arranging mobile devices so that they could be
26 easily accessed while moving was a common approach to configuring space within vehicles. For
27 instance, MS arranged his truck's cab as a mobile office during his long drives to client sites:

28
29
30
31
32 *The last truck I rented was a Dodge pickup. It had 4 power outlets in it. I plug in my phone. I*
33 *plug in my laptop. I plug in my CB. All those things were going at one time. If a car did not*
34 *have multiple power outlets I don't want it. It's not useful. I need to be able to set stuff up so*
35 *that it is useful and I can see things while I am going someplace. Or if I pull over I want a*
36 *comfortable position to work from. (MS)*

37
38
39 The configuration of vehicle space gave MS the discretion to make his work-life boundaries more
40 permeable as he travelled. The affordances of mobility, interoperability and connectedness
41 allowed MS to work and to communicate with those in his personal life while driving, thus
42 supporting a work-life integration strategy.

43
44
45
46
47 Another example of configuring space was TH's practice of deploying wireless networks
48 in places that he visited frequently, such as his mother's and cousin's houses:

49
50
51
52 *Momma doesn't care. She doesn't need it [wireless network]. When I go over there I just want*
53 *to be connected. As soon as I pull up in the yard, I turn it on. My cousin's house, I spend quite*
54 *a bit of time over there. I put a wireless network over there. I just like to be connected. (TH)*
55
56
57
58
59
60

1
2
3 By remaining connected to work even when visiting family members, TH was able to execute a
4 work-life integration strategy. The affordances of interoperability, connectedness and mobility
5 allowed him to increase the permeability and flexibility of physical boundaries.
6
7
8

9 10 **Managing Temporal Boundaries**

11
12 Managing temporal boundaries included practices that applied mobile technologies to
13 regulate the sequence and duration of work-life transitions. These practices included scheduling,
14 converting dead time into productive time, and multitasking versus working sequentially.
15
16

17
18 *Scheduling.* Some mobile workers in our sample scheduled work-life activities using
19 mobile versions of applications such as Outlook and Franklin Covey. Workers also used home
20 versions of collaboration software such as Microsoft Homeserver and Outlook to schedule
21 activities in the home. The interoperability affordance allowed users to synchronize data across
22 mobile devices and family members' business and personal calendars while the personalization
23 affordance allowed mobile workers to create time segments devoted to work and personal
24 matters. For example, by using shared calendars on his mobile device, CD was able to schedule
25 his work-life transitions to mesh with those of other household members .
26
27
28
29
30
31
32
33
34

35
36 *I try to put in all my time constraints and requirements. Whether they be personal or business.
37 I have one calendar that has everything, basically. ...My family, they each have a calendar in
38 Outlook. And since I run everything out of the house, we're able to share them. (CD)*
39

40
41 Others used connectedness to increase the flexibility and the permeability of the temporal
42 boundary between work-life domains. For DV, mobile technology provided the capacity to
43 execute activities outside the time periods where such activities are traditionally performed, thus
44 supporting her integrated boundary management strategy.
45
46
47
48

49
50 *It's not that I work 8 to 5, Monday through Friday, or 8 a.m. to 8 p.m. I've been on the phone
51 at 2 in the morning but it didn't mean that I started talking at 7[a.m]. ...I probably went to the
52 mall that afternoon. So it's not that I work so many more hours. (DV)*
53
54
55
56
57
58
59
60

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Connectedness also facilitated the construction of rigid temporal boundaries. For example, BC defined a rigid temporal boundary between work and nonwork activities by turning his mobile phone off when his traditionally defined work day ended.

Between the hours of say 6[a.m.] and 6 [p.m.], half the day is for work. The other half is mine. If I shut the phone off and don't answer it till 6 [a.m.] the next day, I don't have a problem with that. Whatever happens happens. Whatever didn't happen didn't happen. It makes no difference to me. (BC)

Converting dead time into productive time. Another time management practice used by many of the mobile workers in our sample was converting dead time into productive time. In manufacturing settings, dead time refers to a period when a worker is unproductive because of a machine malfunction or interrupted flow of materials. For mobile workers, dead time occurred while waiting for a flight, when traveling between destinations, and while waiting in a client's office. Instead of accepting these times as unproductive, mobile users recognized that mobile technology could transform periods of dead time into opportunities to increase productivity. For example, MG traveled on trains with a smartphone, laptop, air card and GPS. Mobility and connectedness allowed him to use the mobile devices to prepare for training: *"Rather than drive and have six hours of dead time, I took the train so I could utilize those hours."*

Other mobile workers welcomed dead time and decided not to convert dead time into productive time. As stated by GT:

I don't care about sitting in the airport pulling out a laptop trying to check an email. I'd rather get to my destination and then do it. ...I want to read. I want to relax. And I want to get adjusted to the new time zone. (GT)

The decision to use mobile devices during dead time resulted in either an integration or segmentation strategy. For instance, when dead time occurred during traditional working hours, mobile workers could use mobile technology either to increase work productivity or to carry out personal activities. Conversely, when dead time occurred during traditional personal time, mobile workers could also use technology to work.

1
2
3 *Multi-tasking vs. working sequentially.* Users who overlapped tasks during the same time
4
5 period explained how they used mobile technology for integrating work-life activities. For
6
7 example, GF explained how mobility and connectedness helped him to conduct business between
8
9 golf shots:
10

11 *You hit your shot then while you're walking you finish the email, or you have your headset on*
12 *and you get really good at being on a conference call while you're concentrating on that 10*
13 *foot putt that's gonna win you \$10 from your friends. (GF)*
14
15

16 Other mobile workers used mobile technology to work sequentially. For instance,
17
18 mobility and connectedness helped BC to manage his work at remote sites; he used his mobile
19
20 phone to call into a timekeeping system, logging in when work commenced and ended.
21

22 *I get up early and I log in. ...And when I see what has to be done I get started. I would call in*
23 *my time before I leave the house ...and go to work. Well, our hours are 7 to 4. So by 4 I try to*
24 *be done. If I'm not, of course, then I just work 'til I'm done. And I call off then and then drive*
25 *home. (BC)*
26
27

28 **Managing Psychological Boundaries**

29 Mobile users managed transitions between work and family domains by constructing
30
31 rules governing when mobile technology use was appropriate for one domain but not the other.
32
33 Blending psychological boundaries occurred when a mobile user applied similar rules for using
34
35 mobile technology in their work and family domains. Mobile users managed their psychological
36
37 boundaries using three types of rules: technology designation rules, boundary permeation rules,
38
39 and disconnection rules.
40
41

42 *Technology designation rules.* The rules governing use of mobile technology to manage
43
44 psychological borders were derived in part from organizational policy. Technology designation
45
46 rules helped to guide the separation and combination of mobile devices, applications and data. To
47
48 ensure the security of corporate data, organizations often prohibited the use of corporate mobile
49
50 technology for personal use. Technology designation rules also arose from users' desire to
51
52 separate their personal and work domains. For example, JM consciously designated her
53
54 BlackBerry to support her professional role and her iPhone to support her personal roles. JM's
55
56 decision was intended to keep work from overwhelming her family obligations.
57
58
59
60

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

I put my personal stuff on my Mac with my iPhone, and so personal stuff like doctor's appointments, graduations, birthdays, anniversaries, dinner with somebody on Friday, drinks with somebody, that all goes personal (iPhone). But gotta be in New York, gotta be in Chicago, that stuff goes in the work BlackBerry. ...When I go to the doctor's office and they're like, "So look, here's your next appointment," the first thing I do is whip out my BlackBerry and then the second thing I do is look at my personal [iPhone]. (JM)

In this instance, to implement boundary rules, JM relied on the mobility and personalization affordances to designate multiple devices to specific domains.

Others managed psychological borders by combining professional and personal matters into the same technology devices and applications. In DV's role as an executive in an information services firm, she was expected to be constantly available to corporate demands. Since her personal objective was to succeed professionally, DV designated a single mobile device for both family and work domains so that she could execute transitions more quickly: *"I don't want to have two cell phones; I don't want to have two laptops; that just would not work for me."* The personalization, identifiability and interoperability affordances enabled DV to maintain her integration strategy. Identifiability allowed DV to identify which mobile email addresses were work or personal. Personalization allowed her to maintain separate email addresses and data on a single mobile device, and interoperability allowed the integration of personal and work data from different sources on a single device.

Boundary permeation rules. Mobile workers also developed social rules to accept or divert attempted boundary permeations arriving through email, voice mail, and IM. Although mobile workers sometimes had fixed working hours, employers often expected mobile users to be constantly available and responsive. As a result, mobile users were pressured to accept permeations of their psychological boundaries, using mobile technology's connectedness affordance. Through the identifiability affordance, technology features enabled users to establish a unique online presence and to inform others of their availability for boundary permeations. For instance, SI used email and IM on her laptop and smartphone to make herself continuously available for business permeations. She explained the rationale for the constant availability rule:

1
2
3 “It’s been told to us. We have to be online as much as possible because we’re a virtual
4 company.” However, SI did not accept IM permeations from her personal domain. Therefore
5 connectedness facilitated different rules for the work and personal domains, thus supporting a
6 mixed segmentation/integration strategy.
7
8

9
10
11 Other mobile workers applied the constant availability rule to satisfy personal objectives
12 to attend to both family and work domains equally. For example, MG used IM on his laptop to
13 inform both business and personal domain members of his location, availability, current activity
14 and even state of mind. MG described how identifiability and connectedness enabled this
15 integrated boundary management practice, even while actively engaged in training:
16
17

18
19
20
21
22
23 *My fiancée and I have access to each other almost 24/7 if I am online and she is online at*
24 *work. ...I never ever let my students know. I could be in a middle of a lecture and up would*
25 *come a question and I would notice her name highlighted on my personal screen and I would*
26 *just make note of it so that at the next opportunity I can respond to it. (MG)*
27

28
29 Mobile workers also used mobile devices to selectively use mobile technology’s features
30 to delay permeations by scheduling appropriate times, places and contexts to accept or process
31 permeations. For example, RE preferred a smart phone for email, Internet services, and voice
32 conferencing. As RE moved from place to place, connectedness allowed him to selectively accept
33 or divert domain permeations.
34
35

36
37
38
39 *If somebody’s sending me an e-mail at 10 at night, that’s probably because they have*
40 *something that needs my attention at 10 at night, whether it’s a customer or a friend. So I like*
41 *being able to get it at that time and then I can decide I’ll either respond to that tomorrow or*
42 *no, this looks like something I need to respond to immediately. (RE)*
43

44
45 *Disconnection rules.* Mobile users also developed rules governing the disconnection of
46 mobile devices. Some mobile users never disconnected from either work or life domains because
47 connectedness supported their preferred integrated boundary management strategy. For RE:
48
49

50
51
52 *There really isn’t a time when I disconnect. It’s always on unless I’m on a plane or out of cell*
53 *service -- on a remote mountain somewhere, I’m pretty much always connected. ...And I do*
54 *find it fairly conducive to...both personal and work life to be always connected. (RE)*
55

56
57 Although some mobile users constantly accepted permeations from their work and life
58 domains, others applied rules to determine whether or not to accept permeations. Constant
59
60

1
2
3 connection through mobile technology resulted in some mobile workers unwittingly extending
4 the time to work and neglecting personal matters. For example, SI shared her concerns about
5 constant availability: “*So it’s really hard for me to just be available all the time. But I find that I*
6 *can’t really stop it. ...It’s a struggle.*”
7
8
9

10
11
12 Other mobile users regularly disconnected from the work domain in order to have more
13 personal time. GF disconnected from his work domain because he believed that time off was
14 important to remaining productive.
15
16

17
18 *I work in an environment where people are connected 7 by 24 and just because they're*
19 *sending an email at Saturday night at 9 they expect an answer. Well, I don't work that way.*
20 *...through the normal run of business, there is switch off time. ...Because if I'm constantly*
21 *connected I am actually less productive. (GF)*
22
23

24 25 **DISCUSSION**

26
27 We sought to understand *how mobile technology is implicated in the work-life boundary*
28 *management practices of mobile workers.* As summarized in Table 2, our results demonstrate a
29 variety of work practices enabled by the affordances emanating from the relationship between
30 mobile users’ abilities and mobile technology’s material properties. These work practices
31 comprise three general strategies for managing physical, temporal and psychological work-life
32 boundaries. Our analysis identifies five specific affordances: mobility, connectedness,
33 interoperability, identifiability, and personalization. As stated in the literature review, three of
34 these affordances were suggested by prior studies on mobile technology’s use in organizations;
35 mobility, connectedness and interoperability. Further, we identified personalization and
36 interoperability as additional affordances. These affordances emerge as human actors exercise
37 discretion over the selection and use of mobile technologies and their deployment to support
38 work-life boundary management strategies. The remaining discussion relates these findings to
39 prior research on work-life boundary management, showing how mobile technology’s
40 affordances become directly implicated in three boundary management strategies.
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46

Our results corroborate criticisms in the work-life balance literature concerning the segmentation-integration continuum (Bulger et al. 2007; Golden and Geisler 2007; Kreiner et al. 2009; Moen et al. 2008). Our sample shows a diversity of approaches to managing work-life boundaries that cannot be comfortably located along a single continuum ranging from segmentation to integration of work-life domains as suggested by prior research (Ashforth et al. 2000). Although a few respondents in our study expressed preferences for segmentation, most described practices that included both segmentation and integration in various combinations. As Henfridsson and Lindgren (2005) found, mobile workers accessed mobile technology to facilitate micro transitions between work and personal activities that were independent of physical locations or time of day. Mobile technologies also afforded users' choices to make more frequent, intermittent transitions between life domains (Golden and Geisler 2007). Moreover, mobile workers in our study were not necessarily consistent across their strategies of managing physical, temporal and psychological boundaries. Rather, they altered and personalized their practices depending on changing needs. In some instances, workers who welcomed intrusions from family during work time resisted intrusions from work during personal time. These findings are consistent with those of recent studies (e.g., Hislop and Axtell, 2011; Richardson and Benbunan-Fich, 2011; Senarathne Tennakoon et al. 2013) and supportive of Bulger et al.'s (2007) conclusion that patterns of work-life boundary management may differ depending on the domain of reference. Overall, our findings strongly suggest that mobile technologies are implicated in mixed strategies that combine elements of both segmentation and integration.

47
48
49
50
51
52
53
54
55
56
57
58
59
60

Our results indicate that the affordances of mobile technologies are directly implicated in all three of the work-life boundary management strategies employed. Affordances such as connectedness, interoperability and mobility enabled the management of physical boundaries by allowing mobile workers to select a greater variety of places to work. Once situated physically, workers configured their surroundings to support mobile computing activities in both work and non-work domains and to execute work-life domain transitions. These findings are consistent

1
2
3 with Brown and O'Hara's (2003) description of manipulating space to support mobile computing
4 activities, and practices such as cocooning and camping in public places (Ito et al. 2009). The
5 potential to connect with members of both work and personal domains at any time enabled
6 individuals' efforts to manage temporal boundaries so that the demands of both domains were
7 met. For many, mobile technology's use to effect more frequent temporal transitions between
8 domains allowed both domains to receive attention when needed (Morris and Madsen 2007). The
9 interoperability affordance facilitated collective scheduling of family and work activities, and
10 both connectivity and mobility were directly implicated in the practices of multi-tasking and
11 converting dead time into productive time.
12
13
14
15
16
17
18
19
20
21

22
23 Psychological boundaries are constituted by social rules governing the appropriateness of
24 mobile computing activities in different work-life domains. Our findings suggest three rules
25 relevant to managing psychological boundaries. Technology designation rules allowed mobile
26 workers to separate domains by assigning different mobile devices to different domains.
27 Personalization and identifiability are affordances that are directly implicated in this practice.
28 Rules governing boundary permeation and disconnection also supported psychological boundary
29 management. Connectivity clearly affords boundary permeations, while also implying the ability
30 to disconnect when desired. Personalizing mobile devices to regulate boundary permeations
31 allowed mobile workers to honor commitments to be available to either domain, thus meeting
32 both work and non-work obligations. This ability to be "absent-present" online (Gergen 2002)
33 allowed mobile workers to focus attention to various domains as necessary.
34
35
36
37
38
39
40
41
42
43
44
45

46
47 Our focus on technology affordances contributes to theories of work-life boundary
48 management by including technology as an explanatory concept. Our findings explain how and
49 why technology affordances are implicated in individuals' strategies for managing work-life
50 boundaries. Although Kreiner et al. (2009) include technology as one of several boundary
51 management tactics, our analysis places technology affordances in a more central theoretical role.
52 Given the widespread availability and use of mobile devices and services, the inclusion of
53
54
55
56
57
58
59
60

1
2
3 technology's material features represents a needed extension of work-life boundary management
4
5 theory.
6

7
8 Although we did not exploit the difference between phase 1 and phase 2 data in our
9
10 analysis and results, the set of interviews conducted in 2008 suggests that more advanced mobile
11
12 technologies are associated with affordances that enable a wider variety of work-life boundary
13
14 management practices. As mentioned in our Method section, we constructed the category of
15
16 temporal boundary management to reflect new kinds of work practices by mobile users in our
17
18 sample. Compared to 2004, technologies such as air cards and Blackberries increased the
19
20 potential of affordances of connectedness, interoperability, and mobility. Thus, a mobile user in
21
22 2008 could execute more functions on a single, smaller device than in 2004. These technological
23
24 advances alter existing affordances and allow mobile workers who understand them to exert
25
26 greater control over work-life boundaries.
27
28

29
30 Our research demonstrates the value of theorizing technology as affordances. The theory
31
32 of affordances positions technology's numerous material features as necessary but not sufficient
33
34 conditions for managing work-life boundaries (Markus and Silver 2008). As our findings show, a
35
36 relatively small number of affordances are identified in our study, and they represent the
37
38 relationship between specific material features and users interested in managing work-life
39
40 boundaries. These affordances do not determine or dictate the users' strategic approach to
41
42 boundary management because users perceive technologies differently and have different work-
43
44 life management preferences. Rather, the affordances related to mobile technologies may support
45
46 the execution of both extremes of segmentation and integration, as well as mixed strategies.
47
48 Because the material properties of an object can provide multiple affordances, it is possible that
49
50 one object can produce multiple effects (Treem and Leonardi 2012). The relational definition of
51
52 affordances clearly supports the interpretation of findings showing that actors employ similar
53
54 technologies in different ways.
55
56
57
58
59
60

1
2
3 Our results should not be taken as an exhaustive classification of either boundary
4 management practices or technology affordances. As we noted earlier, existing typologies of
5 mobile technology affordances share little in common, and new categories of affordances are
6 likely to emerge in different empirical contexts. Moreover, although we analyze them separately,
7 mobile workers' boundary management strategies are interdependent partly because mobile
8 workers are always situated in both space and time. Kreiner et al. (2009) argue that some
9 conceptual overlaps are to be expected in the study of work-life boundary management and, in
10 practice, the effects of multiple tactics may be synergistic, "creating a multipronged approach to
11 negotiating the work-home boundary" (p. 724). While our aim is to identify distinct affordances
12 and practices, we recognize that future research might reveal categories that are not included in
13 our results.
14
15
16
17
18
19
20
21
22
23
24
25
26

27 CONCLUSION

28
29 As work continues to become detached from specific times and places, the management
30 of work-life boundaries will become increasingly important, especially for mobile workers. Our
31 study supports a new perspective on the role that mobile technology plays in mobile workers'
32 management of work-life boundaries. The technology affordances of mobility, connectedness,
33 personalization, identifiability, and interoperability support individual strategies for managing
34 physical, temporal and psychological work-life boundaries. By focusing on both the material
35 aspects of the technology and actors' preferences, our approach helps to compensate for the
36 neglect of technology in work-life boundary management theories. By theorizing the relationship
37 between the material characteristics of technology and mobile users in terms of affordances, we
38 grant technology a central rather than peripheral role in explaining work-life boundary
39 management practices.
40
41
42
43
44
45
46
47
48
49
50
51
52

53 Our main contributions, summarized in Table 2, don't represent an attempt at general
54 theory. Rather, our aim is to generate rich, local insights into the relationship between one
55 particular kind of technology (mobile devices and services) and the practices used by mobile
56
57
58
59
60

1
2
3 workers to manage work-life boundaries. Because the material features of information
4 technologies are under theorized (Leonardi and Barley 2008), a more nuanced investigation
5 relying upon qualitative methods and a small sample is justified. As Kreiner et al. (2009) also
6 found, qualitative methodology helps to surface details of practice that would not be detected
7 with quantitative survey methods.
8
9

10
11
12
13
14 Our choice of a more focused inquiry on a restricted sample of mobile workers poses
15 some obvious limitations. We sampled workers because they were highly mobile and used
16 multiple devices and services to support their work. As a result, we are unable to offer direct
17 comparisons between mobile workers and either stationary workers or workers who do not use
18 mobile technologies to manage work-life boundaries. However, our results bear similarities to the
19 behavioral, temporal and physical tactics employed by parish priests (Kreiner et al. 2009), whose
20 work and home lives are typically separated by no more than a few miles and who tend to prefer
21 more segmentation than integration. Our study offers greater insight into the uses of mobile
22 technologies than studies of place-bound workers, and it provides the foundation for designing a
23 broader comparative study of work practices afforded by mobile technologies.
24
25
26
27
28
29
30
31
32
33
34
35

36 Although we do not claim that our results are generalizable to other time periods, we
37 observed some of the same affordances and practices in both 2004 and 2008, even though our
38 samples comprised different mobile workers who used mobile devices with varied material
39 features. The study's design provided the opportunity to observe affordances that endured across
40 time, even when changes in mobile technologies occurred. However, while mobile technologies
41 changed, it is important to note that certain core material properties of mobile technologies
42 remained the same across the two time periods. That is, from 2004-2008, mobile technologies
43 remained small, lightweight, and easy to carry with the potential to be connected to the Internet
44 and other computing and information services anytime, anyplace.
45
46
47
48
49
50
51
52
53
54

55 Since 2008, new mobile technologies have emerged that embody these same properties.
56 These mobile technologies include larger smartphones, tablets, and e-readers with built in Internet
57
58
59
60

1
2
3 connectivity; more pervasive and faster mobile network connectivity such as 3G and 4G
4 networks; and the greater availability of personal and business mobile apps. Though different
5 from the technologies used in our sample, current mobile technologies embody the core mobile
6 material properties of small size, light weight, and connectivity the mobile devices in our samples
7 in 2004 and 2008 possessed. We surmise that these core mobile material properties provide
8 opportunities for users to interact with them in a manner to make the five affordances possible.
9 Therefore, actors interacting with mobile devices in the future may experience affordances
10 similar to those we observed because of the presence of the core mobile material properties. This
11 speculation is consistent with prior research that suggests that the affordances of one technology
12 are similar across different settings and time periods because the material features of the
13 technology place limits on people's interpretations and possibilities for use (Leonardi and Barley
14 2008; Leonardi 2011; Treem and Leonardi 2012). Future research could explore how material
15 features and related affordances extend across time periods and examine how new affordances
16 and practices emerge as new mobile technology becomes available. Future research could also
17 produce deeper insight into the skills, or "effectivities" (Wells 2002), of actors as they gain
18 experience with mobile technology's affordances over time.

19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38 Our study is also limited by its reliance on interviews and, in phase 1, observation as data
39 sources. Thus, our account relies upon the testimony of mobile workers rather than that of co-
40 workers, family members or supervisors. Given this lack of contextualization, we could not
41 "triangulate" a respondent's account of managing their transitions between work and family
42 domains with other family members. This limitation can be offset by more intensive research that
43 engages more contextualized empirical evidence.

44
45
46
47
48
49
50
51 By choice, we are limited in our ability to support conclusions about the psychological
52 state of well-being that the concept of work-life balance implies (Grzywacz and Carlson 2007).
53 We are sensitive to the fact that some users may not exercise good judgment in managing work-
54 life boundaries and may, as a result, experience the negative consequences of boundary blurring
55
56
57
58
59
60

1
2
3 and role conflict. Our empirical objective was not to evaluate the effectiveness of mobile workers
4 in achieving work-life balance. Rather, our focus is restricted to the role that mobile technologies
5 play in managing work-life boundaries. As our review of the literature on work-life boundary
6 management advocates, the concept of work-life balance should be separated conceptually from
7 the boundary management activities that promote balance. Because work-life balance also
8 depends upon individual preferences (Desrochers et al. 2005), and differences such as sex and
9 gender (Powell and Greenhaus 2010), conclusions about affective outcomes of mobile work
10 practices require a more extensive study including additional factors. For example, future
11 research could study the various forms of external social pressure on individual boundary
12 management strategies, including the institutional context that helps to define appropriate
13 behaviors (Ashforth et al. 2000; Rothbard et al. 2005). In some high-technology professions,
14 working long hours has become an institutionalized expectation (Jackson et al. 2006; Perlow
15 1999; Tapia 2004), and few workers in our sample were free from such pressures. A more
16 complete analysis of the sources of work (and family) pressures that condition work-life
17 boundary management would be welcome.
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34

35
36 In conclusion, the prevalence of mobile work promises to increase along with the
37 proliferation of mobile technology's features and applications. Our analysis of mobile workers
38 differs from many prior investigations by focusing on the relationship between the material
39 properties of technology and mobile workers' abilities and preferences. The affordances ensuing
40 from this relationship help to explain how mobile technologies enable and constrain workers'
41 efforts to manage work-life boundaries. We show that mobile workers engage resourcefully with
42 the material features of mobile technologies to produce affordances that are incorporated into
43 their work practices. As a result, they are able to manage the physical, temporal and
44 psychological boundaries that separate their work and non-work domains.
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

REFERENCES

- Ahuja, M.K., Chudoba, K.M., Kacmar, C.J., McKnight, D.H., and George, J.F. (2007). "IT road warriors: balancing work-family conflict, job autonomy, and work overload to mitigate turnover intentions," *MIS Quarterly*, 31 (1), 1-17.
- Arminen, I. (2009). "New reasons for mobile communication: intensification of time-space geography in the mobile era." In Ling, R. and Campbell, S.W. (Eds.), *The Reconstruction of Time and Space: Mobile Communication Practices*, Transaction Publishers, New York.
- Arnold, M. (2003). "On the phenomenology of technology: the "Janus-faces" of mobile phones." *Information and Organization* 13 (4), 231-256.
- Ashforth, B.E., Kreiner, G.E., Fugate, M. (2000). "All in a day's work: boundaries and micro role transitions," *Academy of Management Review*, 25 (3), 472-491.
- Baron, N.S. (2008). *Always On: Language in an Online and Mobile World*. Oxford University Press, New York.
- Boswell, W.R., and Olson-Buchanan, J.B. (2007). "The use of communication technologies after hours: the role of work attitudes and work-family conflict," *Journal of Management*, 33 (4), 592-610.
- Brown, B., and O'Hara, K. (2003), "Place as a practical concern of mobile workers," *Environment & Planning A*, 35, 1565-1587.
- Bulger, C.A., Matthews, R.A., and Hoffman, M.E. (2007). "Work and personal life boundary management: boundary strength, work/personal life balance, and the segmentation-integration continuum," *Journal of Occupational Health Psychology*, 12 (4), 365-375.
- Chemero, A. (2003). "An outline of a theory of affordances," *Ecological Psychology*, 15 (2), 181-195.
- Clarke, S. (2000). "Work/family border theory: a new theory of work/family balance," *Human Relations*, 53, 747-770.
- Cousins, K and Robey D. (2005), "Human Agency in a Wireless World," *Information & Organization*, 5 (2), 2005, 151-180.
- Davis, G.B. (2002). "Anytime anyplace computing and the future of knowledge work," *Communications of the ACM*, 45 (12), 67-73.
- Desrochers, S., Hilton, J.M., and Larwood, L. (2005). "Preliminary validation of the work-family blurring scale," *Journal of Family Issues*, 26 (4), 442-466.
- Duxbury, L.E., Higgins, C.A., and Mills, S. (1992). "After hours telecommuting and work-family conflict: a comparative analysis," *Information Systems Research*, 3 (2), 173-190.
- Gergen, K.J. (2002). "The Challenge of Absent Presence in Perpetual Contact" In Katz, J.E. and Aakhus, M.A. (Eds.), *Perpetual Contact: Mobile Communication, Private Talk, Public Performance*, Cambridge University Press, Cambridge, pp. 227-241
- Gibson, J.J. (1979). *The Ecological Approach to Visual Perception*. Houghton Mifflin, Boston.
- Golden, A.G., and Geisler G. (2007). "Work-life boundary management and the personal digital assistant," *Human Relations*, 60 (3), 519-551.
- Govindaraju, M., and Sward, D. (2005). "Effects of wireless mobile technology on employee work behavior and productivity: an Intel case study." In Sorensen, C., Yoo, Y., Lyytinen, K., and

- 1
2
3 DeGross J. (Eds.), *Designing Ubiquitous Information Environments: Socio-Technical Issues and*
4 *Challenges*. Springer, New York.
5
6 Greenhaus, J.H., and Beutell, N.J. (1985). "Sources of conflict between work and family roles,"
7 *Academy of Management Review*, 10 (1), 76-88.
8
9 Greenhaus, J.H., and Powell, G. (2006). "When work and family are allies: a theory of work-
10 family enrichment," *Academy of Management Review*, 31 (1), 72-92.
11
12 Grzywacz, J.G., and Carlson, D.S. (2007). "Conceptualizing work-family balance: implications
13 for practice and research," *Advances in Developing Human Resources*, 9 (4), 455-471.
14
15 Henfridsson, O., and Lindgren R. (2005). "Multi-contextuality in ubiquitous computing:
16 investigating the car case through action research," *Information and Organization*, 15 (2), 95-124.
17
18 Hill, E.J., Hawkins, A.J., and Miller, B.C. (1996). "Work and family in the virtual office:
19 perceived influences of mobile telework," *Family Relations*, 45 (3), 293-301.
20
21 Hislop, D., and Axtell, C. (2011). Mobile phones during work and non-work time: A case study
22 of mobile, non-managerial workers." *Information and Organization*, 21(1), 41-56.
23
24 Hutchby, I. (2001). Technologies, texts and affordances," *Sociology*, 35 (2), 441-456.
25
26 IDC, (2012). "Mobile Worker Population to Reach 1.3 Billion by 2015, According to IDC."
27 Accessed June 11, 2013 at <http://www.idc.com/getdoc.jsp?containerId=prUS23251912>
28
29 Ito, M., Okabe, D., and Anderson K. (2009). "Portable objects in three global cities: the
30 personalization of urban places." In Ling, R. and Campbell, S.W. (Eds.), *The Reconstruction of*
31 *Time and Space: Mobile Communication Practices*, Transaction Publishers, New York.
32
33 Jackson, P., Hosein, G., and Klobas, J. (2006). "Technologies of the self: virtual work and the
34 inner panopticon," *Information Technology & People*, 19 (3), 219-243.
35
36 Jarvenpaa, S.L., Lang, K.R., and Tuunainen, V.K. (2005). "Managing the paradoxes of mobile
37 technology," *Information Systems Management*, 22 (4), 7-23.
38
39 Jonsson, K., Holmström, J., and Lyytinen, K. (2009). "Turn to the material: Remote diagnostics
40 systems and new forms of boundary-spanning," *Information and Organization*, 19 (4), 233-252.
41
42 Kakihara, M., and Sorensen, C. (2001). "Expanding the mobility concept," *ACM's SIGGROUP*
43 *Bulletin*, 22 (3), 33-37.
44
45 Klein, H.K., and Myers, M.D. (1999). "A set of principles for conducting and evaluating
46 interpretive field studies in information systems," *MIS Quarterly*, 23 (1), 67-94.
47
48 Kreiner, G.E., Hollensbe, E.C., and Sheep, M.L. (2009). "Balancing borders and bridges:
49 Negotiating the work-home interface via boundary work tactics," *Academy of Management*
50 *Journal*, 52 (4), 704-730.
51
52 Kristoffersen, S. and Ljungberg, F. (2000). "Mobility: From stationary to mobile work. ". In K.
53 Braa, C. Sorensen, and B. Dahlbom, Eds., *Planet Internet*, Studentlitteratur, Lund, Sweden, 137-
54 156.
55
56 Lal, B. and Dwivedi, Y.K. (2009) "Homeworkers' usage of mobile phones; social
57 isolation in the home-workplace", *Journal of Enterprise Information Management*, Vol.
58 22(3), pp. 257 - 274
59
60 Laurier, E. (2001). "Why people say where they are during mobile phone calls," *Environment and*
Planning D: Society and Space, 19, 485-504.

- 1
2
3 Leonardi, P.M., and Barley, S.R. (2008). "Materiality and change: challenges to building better
4 theory about technology and organizing," *Information and Organization* 18 (3), 159-176.
5
6 Leonardi, P. (2011). When flexible routines meet flexible technologies: Affordance, constraint,
7 and the imbrication of human and material agencies. *MIS Quarterly*, 35(1), 147-167.
8
9 Ling, R. (2004). *The Mobile Connection: The Cell Phone's Impact on Society*, Elsevier.
10
11 Ling, R. (2008). *New Tech, New Ties: How Mobile Communication is Reshaping Social*
12 *Cohesion*, The MIT Press.
13
14 Major, V.S., Klein, K.J., and Ehrhart, M.G. (2002). "Work time, work interference with family,
15 and psychological distress," *Journal of Applied Psychology*, 87 (3), 427-436.
16
17 Markus, M.L., and Silver, M.S. (2008). "A foundation for the study of IT effects: a new look at
18 DeSanctis and Poole's concepts of structural features and spirit," *Journal of the Association of*
19 *Information Systems*, 9, (10/11), 609-632.
20
21 Mason, J. (2002). *Qualitative Researching*, 2nd ed., Sage, Thousand Oaks, CA.
22
23 Mazmanian, M.A., Orlikowski, W.J., and Yates, J. (2005). "Crackberries: the social implications
24 of ubiquitous wireless e-mail devices." In Sorensen, C., Yoo, Y., Lyytinen K., and DeGross J.
25 (Eds.), *Designing Ubiquitous Information Environments: Socio-Technical Issues and Challenges*,
26 Springer, New York.
27
28 Middleton, C.A., and Cukier, W. (2006). "Is mobile email functional or dysfunctional? Two
29 perspectives on mobile email usage," *European Journal of Information Systems*, 15 (3), 252-260.
30
31 Miles, M.B. and Huberman, A.M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook*,
32 Sage, Thousand Oaks, CA..
33
34 Moen, P., Kelly, E., and Huang, R. (2008). "Fit Inside the work-family black box: an ecology of
35 the life course," *Journal of Occupational and Organizational Psychology*, 81, 411-433.
36
37 Morris, M.L., and Madsen, S.R. (2007). "Advancing work-life integration in individuals,
38 organizations, and communities," *Advances in Developing Human Resources*, 9 (4), 439-454.
39
40 Nippert-Eng, C. (1996). *Home and Work*. University of Chicago Press, Chicago.
41
42 Nansen, B., Arnold, M., Gibbs, M., and Davis, H. (2010). "Time, space and technology in the
43 working home: an unsettled nexus," *New Technology, Work and Employment* 25 (2), 136-153
44
45 Norman, D.A. (1988). *The Psychology of Everyday Things*. Basic Books, New York.
46
47 Orlikowski, W.J. (2010). "The sociomateriality of organisational life: considering technology in
48 management research," *Cambridge Journal of Economics*, 34, 125-141.
49
50 Orlikowski, W.J., and Scott, S.V. 2008. "Sociomateriality: Challenging the Separation of
51 Technology, Work and Organization," *Academy of Management Annals* (2:1), pp 433-474.
52
53 Palen, L. (2002). "Mobile Telephony in a Connected Life," *Communications of the ACM* 45 (3),
54 pp 78-82.
55
56 Perlow, L.A. (1998). "Boundary control: The social ordering of work and family time in a high-
57 tech corporation," *Administrative Science Quarterly*, 43 (2), 328-357.
58
59 Perlow, L.A. (1999). "The time famine: toward a sociology of work time," *Administrative Science*
60 *Quarterly*, 44 (1), 57-81.

1
2
3 Pollock, N., Williams, R., D'Adderio, L., and Grimm, C. (2009). "Post local forms of repair: The
4 (extended) situation of virtualized technical support," *Information and Organization*, 19 (4), 253-
5 276.

6
7 Powell, G.N., and Greenhaus, J.H. (2010). "Sex, gender, and the work-to-family interface :
8 exploring negative and positive interdependencies," *Academy of Management Journal*, 53 (3),
9 513-534.

10
11 Prasopoulou, E., Pouloudi, A., and Panteli, N. (2006). "Enacting new temporal boundaries: the
12 role of mobile phones," *European Journal of Information Systems*, 15 (3), 277-284.

13
14 Quesenberry, J.L., and Trauth, E. (2005). "The role of ubiquitous computing in maintaining
15 work-life balance: perspectives from women in the information technology workforce," In
16 Sorensen, C., Yoo, Y., Lyytinen K., and DeGross, J. (Eds.), *Designing Ubiquitous Information*
17 *Environments: Socio-Technical Issues and Challenges*. Springer, New York.

18
19 Reinsch, J.N.L., Turner, J.W., and Tinsley, C.H. (2008). "Multicommunicating: a practice whose
20 time has come?" *Academy of Management Review*, 33 (2), 391-403.

21
22 Richardson, K., and Benbunan-Fich, R. (2011). "Examining the antecedents of work connectivity
23 behavior during non-work time," *Information and Organization*, 21 (3), 142-160.

24
25 Robey, D, Anderson, C., and Raymond, B. (2013). "Information Technology, Materiality and
26 Organizational Change: A Professional Odyssey." *Journal of the Association for Information*
27 *Systems*, 14 (7).

28
29 Rothbard, N.P., Phillips, K.W., and Dumas, T.L. (2005). "Managing multiple roles: work-family
30 policies and individuals' desires for segmentation," *Organization Science*, 15 (3), 243-258.

31
32 Sadler, K., Robertson and T., Kan, M., (2006a). "It's Always There, It's Always On": Australian
33 Freelancer's Management of Availability Using Mobile Technologies, " *Proceedings of Mobile*
34 *HCI'06*, September 12-15, 2006, Helsinki, Finland.

35
36 Sadler, K., Robertson, T., Kan, M., and Hagen, P. (2006b). "Balancing work, life and other
37 concerns: a study of mobile technology use by Australian freelancers." In Mørch, A., Morgan, K.,
38 Bratteteig, T., Ghosh, G., and Svanaes, D. (Eds.), *Proceedings of the 4th Nordic Conference on*
39 *Human-Computer interaction: Changing Roles*, ACM, New York.

40
41 Scheepers, R., Scheepers, H., and Ngwenyama, O. (2006). "Contextual influences on user
42 satisfaction with mobile computing: findings from two healthcare organizations," *European*
43 *Journal of Information Systems*, 15 (3), 277-284.

44
45 Senarathne Tennakoon, K.L.U., da Silveira, G.J.C., and Taras, D.G. (2013). "Drivers of context-
46 specific ICT use across work and nonwork domains: A boundary theory perspective,"
47 *Information and Organization*, 23 (2), 107-128.

48
49 Stoffregen, T.A. (2003). "Affordances as properties of the animal-environment system,"
50 *Ecological Psychology*, 15 (2), 115-134.

51
52 Tapia, A.H. (2004). "The power of myth in the IT workplace: creating a 24-hour workday during
53 the dot-com bubble," *Information Technology & People*, 17 (3), 303-326.

54
55 Tarasewich, P., and Nickerson, R.C. (2002). "Issues in mobile e-commerce," *Communications of*
56 *the Association for Information Systems*, 8, 41-64.

57
58 Tietze, S. (2002). "When work comes home: coping strategies of teleworkers and their families,"
59 *Journal of Business Ethics*, 1 (4), 385-396.
60

1
2
3 Towers, T., Duxbury, L.E., Higgins, C.A, and Thomas, J. (2006). "Time thieves and space
4 invaders: technology, work and the organization," *Journal of Organizational Change*
5 *Management*, 19 (5), 593-618.
6

7 Treem, J.W., and Leonardi, P.M. (2012). "Social Media Use in Organizations: Exploring the
8 Affordances of Visibility, Editability, Persistence, and Association," *Communication Yearbook*
9 36, 143-189.
10

11 Varshney, U., and Vetter, R.J. (2002). "Mobile commerce: framework, applications and
12 networking support," *Mobile Networks and Applications*, 7, 185-198.
13

14 Wells, A.J. (2002). "Gibson's affordances and Turing's theory of computation," *Ecological*
15 *Psychology*, 14 (3), 141-180.
16

17 Zammuto, R. R., Griffith, T., Majchrzak, A., Dougherty, D.J., and Faraj, S. (2007). "Information
18 Technology and the Changing Fabric of Organization," *Organization Science*, 18(5), 749-762.
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Table 1– Demographics of Mobile Computing Users

Phase 1					
SUBJECT	WORK CATEGORY	MARITAL STATUS	GENDER	OCCUPATION	WORK HABITS
TG	Office Based	Married/ children at home	Male	Vice President of Sales & Loan Officer	Work at workplace, satellite office, home and other places.
SW	Office Based	Married / children at home	Female	Junior Sales Officer & Sales Assistant	Work at workplace, satellite offices and home.
NC	Office Based	Married	Male	Assistant Vice President of Sales	Work at workplace, and satellite offices.
RK	Office Based	Single	Male	Loan Officer	Work at workplace, home and other places
BE	Office Based	Married	Female	Assistant Vice President of Marketing	Work mainly at workplace
MR	Office Based	Married	Male	Network Engineer	Work mainly at workplace
MS	Home Based	Married	Male	Quality Engineer	Work at customers' sites and other places.
RS	Home Based	Single	Male	Territory Manager & Client Services Representative	Work at home, customers' sites and other places
TN	Home Based	Single	Male	Pharmaceutical Sales Representative	Work at home, customers' sites and other places.
MG	Home Based / Self Employed	Engaged with child	Male	Microsoft Certified Trainer & IT Consultant	Work at home, customers' sites and other places.
TH	Home Based / Self Employed	Divorced with child	Male	Microsoft Certified Trainer & IT Consultant	Work at home, customers' sites and other places.
Phase 2					
TX	Home Based	Married	Female	Consultant	Work at home, customers' sites and other places.
GF	Home Based	Married with children	Male	Territory Sales Manager	Work at home, customers' sites and other places.
JM	Home Based	Married	Female	Manager Professional Services	Work at home
DV	Home Based	Married with children	Female	Chief Operating Officer	Work at home
CD	Home Based Self Employed	Married with children	Male	Consultant	Work at home, customers' sites and other places.
AJ	Office Based	Single/ Engaged	Male	Project Manager	Work at home, office and other work sites.
GT	Home Based/ Self Employed	Single	Male	Business Development Consultant	Work at home, customers' sites and other places.
WH	Home Based	Married with children	Male	Channel Manager	Work at home, customers' sites and other places.
RE	Home Based	Married with children	Male	Systems Engineer	Work at home, customers' sites and other places.
MH	Home Based	Single	Female	HR Director, Board Secretary, Principal Director, Project Manager	Work at home
ML	Office Based	Married with children	Male	IT Manager	Work at home, customers' sites and other places.
BC	Office Based	Married with children	Male	Cell Site Engineer	Work at office and other work sites.
SI	Home Based	Single	Female	Solution Lead	Work at home
MT	Home Based	Married with children	Female	Director	Work at home, customers' sites and other places.

Table 2 – Strategies, Associated Work Practices and Affordances

STRATEGY	WORK PRACTICES	DESCRIPTION	ASSOCIATED AFFORDANCES
MANAGING PHYSICAL BOUNDARIES	Selecting Space	Selecting appropriate work and personal spaces for mobile technology use.	Mobility, interoperability, connectedness
	Configuring Space	Transforming locations into venues for personal or business use of mobile technologies by arrangement and configuration of mobile technology and other entities in the space available according to personal preferences.	Mobility interoperability, connectedness
MANAGING TEMPORAL BOUNDARIES	Scheduling	Using mobile technology to plan the sequence and duration of work life events	Mobility, connectedness, interoperability, personalization.
	Converting dead time to productive time.	Using mobile technology to manage activities within time periods during which a worker is potentially unable to be productive.	Mobility, connectedness
	Multi-tasking versus working sequentially	Performance of multiple tasks at the same time with some being carried out via mobile technology.	Mobility, connectedness, identifiability
MANAGING PSYCHOLOGICAL BOUNDARIES	Technology Designation Rules	Rules used to determine the relative separation and combination of mobile devices, applications and data.	Mobility, personalization, identifiability, interoperability
	Boundary Permeation Rules	Social rules to accept or divert attempted boundary permeations arriving through mobile technologies.	Mobility, connectedness personalization identifiability.
	Disconnection Rules	Rules for when it is appropriate to disconnect mobile devices.	Connectedness,

Table 3 –Affordances Associated With Mobile Technology Use

AFFORDANCE	DESCRIPTION
Mobility	The potential for the user to move freely and easily while transporting or engaging with a mobile device.
Connectedness	The potential to engage with the mobile technology to establish communications.
Interoperability .	The potential to use mobile technology to share information , data and resources across various heterogeneous devices and applications.
Identifiability	The potential to associate a mobile device or service with a single authorized individual, thus allowing the user to represent a unique identity.
Personalization	The potential to select mobile technology options and settings to match user's personal preferences or needs.

APPENDIX

A. Phase 1 - Descriptive Codes – Round 1 of Data Analysis

DESCRIPTIVE CODES	SUBCODES
Border Composition	Physical Temporal Psychological
Border Blending	
Border Permeations	Work to Home Home to Work Intra Domain Permeations Diversions of Permeations
Border Keepers	Domain members as border keeper User as border keeper Negotiation
Border Crossing	Home to Work Work to Home Intra Domain
Border Flexibility	Temporal Physical Psychological Technological
Domain	Work Home Separation Integration

B. Phase 2 - Work-Life Management Strategies Identified in Round 2 of Data Analysis

PATTERN CODES	INTERPRETIVE CODES	DESCRIPTION
MANAGING SPACE Practices of organizing technology and other artifacts in a physical location to support mobile computing activities.	Managing Mobility	Carrying devices from one location to the other to facilitate work.
	Configuring Space	Arrangement and configuration of devices, networks and other artifacts in the space available to support computing activities.
	Managing Spatial Constraints	Working around restrictions placed on technology use due to limitations in space and unavailability of resources.
MANAGING TIME Practices of managing time to carry out work life events.	Scheduling Time	Using mobile technology to define the sequence and duration of work life events
	Managing Polychronic Time	Using mobile technology so as to carry out work and life events simultaneously. Not sticking to a pre-determined work schedule.
	Managing Monochronic Time	Managing time so as to carry out work like events individually. Sticking to a pre-determined work schedule.
	Managing Dead Time	Managing periods during which a worker is unable to use mobile technology because of unavailability of mobile resources.
MANAGING ACCESSIBILITY Practices of managing communications, interruptions and availability to others for direct interaction.	Integrating and Segmenting Technologies	Integrating or segmenting mobile technologies according to work or life domains.
	Negotiating Access	Negotiating periods of availability via mobile technology with influential domain members in work and life domains.
	Conforming to Organizational Policy	Reference to organizational policy and organizational and societal norms to influence accessibility through mobile devices.
	Managing Online Presence	Representing users' status or context such as current location, mobile device in use and availability.
	Disconnection	Managing accessibility by switching devices off.
MANAGING TRANSITIONS Practices of using mobile technologies to switch between work and family activities.	Managing Connections to Work and Home Life	Managing how mobile technology is used to make the transition from home to work and vice versa.
	Managing Transitioning Activity	Using mobile technologies to facilitate spontaneous and frequent switching from work to life activities and vice versa.
	Intertwining and Separating Work and Family	Using mobile technologies to blend or separate work and life activities.

C. Final Set of Pattern Codes

PATTERN CODES	INTERPRETIVE CODES	SAMPLE DESCRIPTIVE QUOTE
MANAGING PHYSICAL BOUNDARIES	Selecting Space	I was at the gym one time and my PDA actually came in handy because I got an email that I definitely would've missed if I didn't have it with me. -- I was actually on the treadmill and I was typing the messages as I was running-- I was actually preparing for it by bringing it [PDA] with me.(MH)
	Configuring Space	Yeah, I have a laptop table that temporarily is in my vehicle that my laptop sits on. It's connected to my GPS with my wireless card and if I'm at a stop light or some of the cell sites, but I'm still in my vehicle, I use that to access emails. (AJ)
MANAGING TEMPORAL BOUNDARIES	Scheduling Time	Pretty much if it's not on my Outlook calendar for work --in my BlackBerry, it doesn't happen. Outlook is like the center for me, and then the same thing for home. I have my Outlook for home that syncs with my iPhone. If it's not in there, I usually forget about it and I don't do it. (JM)
	Converting Dead Time to Productive Time.	The technology [smartphone] that I have allows me to be productive, whereas people who are not as connected, that would be dead time for them because they can't really do anything. [...] As a matter of fact, those times, believe it or not, are some of the most productive times because I don't have a lot of distractions, I'm just sitting there focused on getting stuff done or trimming the inbox down to size or you know, getting people active on different things where I can really focus with a minimum of distraction. (GF)
	Multi-tasking vs. working sequentially.	So having that flexibility through a mobile device is really important. [...] Because of the convenience that it affords you. The example I guess I could use would be the ability to stay connected and complete a work task predominantly - you know via email while you're running to your child's school to pick him up from school for example because the school's not gonna wait around for you to pick him up at your leisure. You have to pick him up at a designated time so at the same time you might need to get an email out - or respond to an email because you're in the middle of a customer issue (SH)
MANAGING PSYCHOLOGICAL BOUNDARIES	Technology Designation Rules	I still have my personal mobile device and it's kind of like inconvenient to carry two mobile phones on the road; ... You know I have my other business, which I want to make sure that I don't mix and match the personal with the company's technology. So I just said I'd rather carry two mobile devices rather than having them mixed and then I know which phone rings for what. (TX).
	Boundary Permeation Rules	We all have to have an instant messenger ID so that we can communicate easily with each other. So usually as soon as I log on to my laptop I sign in. And then I sign out in the evening. If I'm a meeting or something or if I can't be interrupted I'll put it on busy. If I leave the house to go get something to eat I'll put out to lunch. I usually stay online now. -- So if it's something that's important and I'm not responding back to a coworker then they can try to call me or something. As opposed to waiting for my response. (SI)
	Disconnection Rules	I turned off the phone. [...] Because that's my leisure time. Because I am always connected. --. I just turn off all the equipment. I just don't get online. (TH)