

Embracing or embattled by converged mobile devices? Users' experiences with a contemporary connectivity technology

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Abstract

In this qualitative study, we examine how converged mobile devices (e.g. BlackBerries, Treos, and iPhones) are experienced by users of this contemporary connectivity technology. Perhaps not surprisingly, users experience similar pressures to be accessible and responsive; however, the sources of these expectations extend beyond those internal to organizations to include sources external to organizations (e.g. family, friends, industry, CMD-user community, and society in general). Users' reactions to responsiveness-accessibility pressures differ in this study, clustering into three different categories – 'enthusiastic,' 'balanced,' and 'trade-offs.' Further analyses reveal three emergent factors influencing users' reactions: the number of expectation sources; specificity of the sources; and adoption motives. Our research builds on technology and work studies to include factors that are related to heterogeneity in interpretations and enactments. Moreover, findings suggest that in the context of this connectivity technology, the role of the organization may not be as central as it has been in many other studies of technology and work.

Keywords

BlackBerry, communication, information/knowledge management, iPhone, new technology, organizational theory, smartphone, work environment

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As the number of organizations offering flexible, mobile work practices increases (e.g. Bond et al., 2005; Galinsky et al., 2004; Kelliher and Anderson, 2010; Mazmanian et al., 2006), so do 'technological advances that facilitate nontraditional work arrangements' (VanDyne et al., 2007: 1124). Through the advent of these technologies such as cell phones, laptops with internet access, and converged mobile devices (CMDs), many have commented that we have entered a new era of workplace connectivity (e.g. Mazmanian et al., 2006; Schlosser, 2002) with connectivity technology revolutionizing when, where, how, and how long employees work (Boswell and Olson-Buchanan, 2007; Fenner and Renn, 2010). In this study, we focus specifically on CMDs (e.g. BlackBerries, Treos, iPhones) because they are a contemporary type of connectivity device that facilitates flexible, mobile work arrangements. Moreover, CMDs are an increasingly popular technology worldwide where the number of users is expected to continue growing (Bakhshi et al., 2008; Solutions Research Group, 2008). For example, in a recent forecast, it is predicted that worldwide CMD shipments will grow from 226.8 million units in 2010 to 439.4 million in 2014 (Kevorkian et al., 2010).

Converged mobile devices, also known as smartphones, provide multi-functional computing (e.g. internet, email, phone, data access, calendar, etc.) in a mobile setting, effectively allowing users to conduct a range of work and other tasks without being confined to an office setting. These devices also enable users to quickly and easily connect to many people and information sources from almost any location. Because of their multiple functions and the connectivity capabilities, these devices differ from cell phones. CMDs also differ from laptops in their convenience, size, and ease of connectivity, as conveyed by a CMD user in this study:

Really the beauty of the BlackBerry is you don't have to take your laptop with you a lot. So unless you're working on a big application, you can take your BlackBerry . . . With email it's easier to do it on a handheld device than it is to find a Wi-Fi spot for a laptop.

Because of the ubiquitous nature of connectivity technologies, scholars (e.g. Jessup and Robey, 2002) explain that the use of such a technology calls into question a range of individual, team, and organizational-related issues in the face of this technological shift. At the same time, research on the role of technology generally, and information technology more specifically, in organizations is comparatively limited (Orlikowski and Scott, 2008; Zammuto et al., 2007). In this study, our primary research question is: 'How do working individuals experience a contemporary type of connectivity technology (i.e. converged mobile devices) and what are their reactions to such experiences?' More specifically, we focus on working individuals who use CMDs for work-related purposes with the intent to provide insights into: (a) how users experience this technology; (b) how users react to such experiences; and (c) if and how users' experiences and reactions differ. To do so, we use qualitative methods and an inductive approach to uncover how 54 CMD users experience this technology.

In our study, we find that social influences are important in driving users' experiences and reactions to these experiences. Thus, our study is grounded in the perspective that while the material aspects of a technology are important, the social context in which it

is used is also critical in understanding its meaning and effects (e.g. Barley, 1990; Eriksson-Zetterquist et al., 2009; Orlikowski, 2000, 2007; Orlikowski and Scott, 2008). Much of the current research on the influence of technology on work has shifted towards a social constructionist perspective, largely based on whether the focus of a study is on the drivers of technology adoption (perception perspective), use (interpretation, appropriation and enactment perspectives), or how technology shapes organizational roles and structures (alignment perspective) (see Leonardi and Barley, 2010 for a history). By and large, most of these studies look for commonalities in how technologies are interpreted and/or used in organizational settings based on the social context into which the technology is introduced.

In this study, we find that participants experience similar pressures to be accessible and responsive, which is consistent with findings from previous CMD studies (e.g. Mazmanian et al., 2006; Orlikowski, 2007). However, our findings also suggest that users' reactions to these pressures (i.e. interpretations and use patterns) differ; this is unlike other studies that describe reactions (e.g. compulsion to check incoming emails and difficulty in disengaging) as similar across users (e.g. Mazmanian et al., 2006; Orlikowski, 2007). In this study, users' emergent reactions to experiencing accessibility-responsiveness pressures encompass both: (a) how they interpret the costs and benefits of using a CMD; and (b) how they put this technology into practice related to boundary-setting behaviors. These reactions cluster into three different categories, which we describe as 'enthusiastic,' 'balanced,' and 'trade-offs.'

Based on further analyses, we also find that users are subject to heterogeneous social influences (i.e. expectation sources), which in turn shape their reactions (i.e. interpretive schema and enactments). More specifically, users' adoption motives, expectation sources (whom the user perceives as social influences of pressure), and the number of expectation sources emerge as factors that contribute to users' different reactions. Of particular interest, reasons for adoption (e.g. required by organization vs. personal choice) and perceived pressure from non-organizational influences such as friends, family, industry, and society (along with those internal to the organization) emerge as influential factors in how this technology is interpreted and enacted. This finding is significant because it suggests that the role of the organization is different and perhaps not as central as it has been in past examples of how technology affects work. More specifically, our findings suggest the role of the organization in adopting this technology and how the employee-employer relationship is shaped by users of this technology is different than in past studies of technology and work. As connectivity technologies become more widespread, a shift in attention from focusing primarily on the role of the organization and its influences to include those external to the organization appears to be warranted in order to achieve a better understanding of how connectivity technologies of the future may be put into practice.

Following the example of other studies that use a grounded theory-informed approach, we initially use only a few established ideas and theories to guide the design and execution of our data collection (Beyer and Hannah, 2002; Eisenhardt, 1989; Strauss and Corbin, 1990). As our analyses progressed, we explored other research relevant to emergent findings.

Technology, organizations, and individuals

Indicated earlier, this study focuses on CMD technology (e.g. BlackBerry, Treo, iPhone), which is one of several other technologies that we refer to as connectivity technologies. We define connectivity technology as those technological devices that facilitate being connected with people and information, such as cell phones, laptops with internet access, and one of the most recent and popular devices – CMDs. Before discussing particular studies related to CMDs and other connectivity technologies, we first review research on technology more broadly and perspectives used by scholars to understand its role in work settings.

The role of technology in the workplace has been of interest to organization scholars since the 1950s (Woodward, 1958, 1965) but more recently has ‘virtually died out as a theme’ (Zammuto et al., 2007: 750) despite rapid increases in firm spending on technology and the centrality of technology to organization life (Orlikowski and Scott, 2008; Zammuto et al., 2007). Regardless of the decline of research in this area generally, work on the role of technology in organizations largely falls into two broad categories: research from a technological determinism perspective and research from a technological voluntarism perspective (Eriksson-Zetterquist et al., 2009; Leonardi and Barley, 2010; Orlikowski and Scott, 2008). Research from a determinism perspective looks at technologies as having relatively innate stable qualities that are similarly experienced across organizations (e.g. Eriksson-Zetterquist et al., 2009; Leonardi and Barley, 2010; Orlikowski and Scott, 2008).

This contrasts with a voluntaristic perspective, often dominated in particular by social constructivism, which looks at the role of human agency in shaping the environment to achieve goals (e.g. Leonardi and Barley, 2010). Social constructivists who study the role of technology in work and organizations focus on how the social context into which a technology is introduced affects: a) adoption, b) use, and c) subsequent influence on roles and structure (e.g. Leonardi and Barley, 2010). In our study, we find that there is not one standard interpretative schema or way the technology is put into practice; accordingly, we focus our review of relevant literature around research from a voluntaristic (rather than a deterministic) perspective, specifically related to social constructivism. Also, since we are interested in the experiences of CMD users using the technology, we focus primarily on the areas of research that center around use patterns and experiences; we also briefly discuss the adoption literature. Though we are interested in CMD technology in use, the initial adoption motives of users emerges as an important factor in shaping their reactions to social influences; accordingly, we also comment briefly on the adoption perspective literature. Lastly, we narrow our literature review to those studies that have looked at costs and benefits of connectivity technology more generally along with studies that focus specifically on CMDs.

Technology use in organizations

Leonardi and Barley (2010) identify three social-constructionist-based perspectives that relate to technology use more generally. The first, the interpretation perspective, is a cognitively-oriented perspective that primarily looks at how individuals transfer interpretations from one domain to another to make sense of a new technology. The second,

the appropriation perspective, focuses on how technology use relates to designers' perceptions of how a technology should be used. The third, the enactment perspective, focuses on how the technology is actually used and centers primarily on the evolution of work practices instead of cognitions and norms. In our study, both individual interpretations and use patterns emerged as important; accordingly, the first and third perspectives are most relevant to our work and discussed below.

Research in the interpretation perspective often examines how organization-wide adoptions of technology are made sense of by users. Largely, researchers find that users respond to the new technology by couching it in terms of prior experiences with similar or related technologies (e.g. Orlikowski and Gash, 1994). Also, perceptions of how the technology may be consistent with organizational or occupational norms can shape experiences with a technology (Gopal and Prasad, 2000; Prasad, 1993; Prasad and Prasad, 1994). Even in technologies that allow latitude in how they are used, such as email, user perceptions of what is appropriate use based on prior experiences in the organization are important in driving perceptions and ultimately use patterns (e.g. Markus, 1994). In addition, the goals of the individual user may influence how the technology is perceived and ultimately put to use. For example, Hsiao et al. (2008) found that an automated satellite-based taxi dispatch system was used differently by cab drivers, based largely on what their goals were for their job; some were motivated to be as efficient as possible as a cabbie, others were focused on maximizing pay, others liked to learn from a variety of passengers, while others liked predictability. Such goals influence how they interpreted and used the technology. Thus, interpretive schemas are shaped by experiences with related technologies and perceptions of appropriate use of the technology based on social influences. Though most studies look for commonalities, recent work (e.g. Hsiao et al., 2008) has started to take note of influences that lead to divergence in how a technology is interpreted.

Research in the enactment perspective is primarily centered around how technology is put into practice and has also been referred to as the 'practice perspective' because of its emphasis on how people actually employ technology in conjunction with their work (Leonardi and Barley, 2010; Orlikowski, 2000). Work in this vein focuses not on individual habits, but rather on patterns that are shared (Leonardi and Barley, 2010). As an example, Boczkowski (2004) identified how newsrooms put multimedia and interactive technology to use, based on differences in their organizational structures and view of the technological abilities of their users. Others find that concerns about preserving power and existing role relationships affects how technology is put into practice (Constantinides and Barrett, 2006). Dery et al. (2006) found that managers perceived time to learn a system and changing roles independent of a new technology influenced how the technology was put into practice differently across groups. Lead users can play an important role in driving how a technology is put into practice (e.g. Orlikowski et al., 1995; Yates et al., 1999). This work more recently has evolved to include a 'sociomaterial' lens, whereby researchers have started to look more at how the material aspects of a technology affect how technology is put into use; this perspective combines a voluntaristic perspective – looking at the role of human agency – in conjunction with the material aspects of a technology (Leonardi and Barley, 2010; Orlikowski, 2007; Orlikowski and Scott, 2008; Volkoff et al., 2007).

The interpretation and enactment perspectives on technology use together highlight work to date that examines the role of social contexts. It finds that transference of mental models from other experiences shapes interpretations through schemas and frames, while responses to contextual cues (e.g. formal structure, power relationships, and influential users) shapes use patterns. These studies largely focus on organization-wide adoptions of a technology and the subsequent interpretations and use patterns of such initiatives. In the case of connectivity technology such as cell phones and CMDs – which are often not accompanied by organizationally-derived mandates for how the technology should be used – there are a number of questions worthy of exploration. For example, how is this type of technology interpreted and enacted by users? How are use patterns and interpretations across users similar or different? What factors influence users' interpretive schema and enactment patterns? What role does the organization play and how does that compare with influences outside of the organization's boundaries? As connectivity technologies continue to evolve and become adopted more widely, these questions become increasingly important. Social influences are clearly important in shaping experiences and reactions to technologies in prior studies; we look to examine the nature of such influences with a current type of connectivity technology, CMDs.

The role of adoption motives

While our focus in this study is how CMD technology is interpreted and used, the adoption motive of the user emerges as an important factor contributing to variance in users' reactions. Thus, while we are not interested in predicting adoption, but rather constrain our study to current users of the technology and their experiences, we briefly review the adoption-perspective literature because of the role adoption motives ultimately play in shaping users' interpretative schema and enactment patterns.

Most adoption-motive research examines how attitudes and values of others, specifically those close to the potential adopter/user, shape initial perceptions about a technology. These perceptions generally influence whether or not a technology will be adopted. For example, those within one's work group or with whom the individual closely communicates were more important in shaping relevant values and beliefs than those outside of a work group or managers (e.g. Fulk et al., 1987; Rice and Aydin, 1991). Social influences also shape initial decisions about whether to adopt a technology or not when employees have this choice (Karahanna et al., 1999). This research emphasizes how those close to a person can influence technology-adoption decisions. Thus, we examine how initial adoption motives – they are required by their organizations (i.e. coercive) or they chose to adopt the device to imitate others (i.e. mimetic) – ultimately contribute to users' interpretations and enactments.

Connectivity technology: Converged mobile devices

We have chosen to focus on CMD technology because of its increased use and popularity worldwide. Mentioned earlier, the increase in use of this contemporary device is largely explained by the increase in nontraditional work arrangements, which include more

flexible, mobile work practices such as working remotely. There is a range of reasons for this shift, including the potential for employees to have more control over when and where they work (i.e. schedule control) owing to such arrangements (e.g. Kelly and Moen, 2007; Kossek et al., 2006; Tausig and Fenwick, 2001) and more individuals wanting flexibility (Galinsky et al., 2004).

As the number of organizations offering nontraditional work arrangements continues to rise (e.g. Bond et al., 2005; Galinsky et al., 2004; Kelliher and Anderson, 2010), the use of connectivity technologies – especially those facilitating employees' productivity outside the confines of an office such as CMDs – has also increased. Discussed earlier, CMDs have gained much popularity owing to their compact size and functionality, which allow users to stay connected to information and people almost anywhere. Despite current popularity and predicted expansion of use of this technology (Bakhshi et al., 2008; Kevorkian et al., 2010), research on CMD technology is comparatively limited (Middleton, 2007).

There are a number of studies that explore the use of connectivity technology in general (e.g. mobile phones, etc.) and its impact on work and personal domains (Bellotti and Bly, 1996; Bittman et al., 2009; Cousins and Robey, 2005; Fenner and Renn, 2010; Middleton, 2007; Middleton and Cukier, 2006; Wajcman et al., 2008). Collectively, these studies suggest there are advantages and disadvantages to such technologies. One advantage is that connectivity and individual control over work is increased, having a positive effect on experiences of stress and anxiety (e.g. Mazmanian et al., 2006; Middleton, 2007); another advantage is maintaining connections with family and friends (Wajcman et al., 2008). Related specifically to CMDs, increased efficiency is one of the most noteworthy benefits. For example, CMD users respond to emails more quickly than non-users (Mazmanian et al., 2005); users have greater control over email because they can read and respond to messages throughout the day (Allen and Shoard, 2005); and they can be productive in spare minutes by making use of small portions of time (Govindaraju and Seward, 2005). In addition, users feel empowered through the use of the technology that enables them to remain connected to their work from many locations (Middleton, 2007) and have control over information flow and interruptions (Mazmanian et al., 2006).

Despite these benefits, there are also costs related to connectivity-technology use. For example, individuals have been found to engage in technology-assisted supplemental work after regular business hours that can lead to work-life conflict (Fenner and Renn, 2010). Specifically related to CMD technology, users may work more because: CMDs engender the expectation of availability and responsiveness from organizational members (Mazmanian et al., 2006; Orlikowski, 2007) and work is more available that makes users 'always on call' (Middleton, 2007). In response to responsiveness-accessibility expectations and the material attributes of CMDs, users engage in 'activities to keep devices turned on, to carry them at all times, to glance at them repeatedly, and to respond to email regularly' (Orlikowski, 2007: 1444). Such behaviors may result in negative outcomes related to work-life balance (Middleton and Cukier, 2006; Orlikowski, 2007). In support of this point, 34 percent of 2600 CMD owners from the USA surveyed agree with the statement 'devices like BlackBerry chain you to work more than they liberate you' (Solutions Research Group, 2007).

Studies to date have almost exclusively focused on similarities associated with mobile and/or connectivity technologies. There are a few exceptions such as Golden and Geisler's (2007) research on how personal digital assistants (a type of mobile technology without internet access that functions as a daily planner) are used differently as boundary-management tools by their users. Specifically related to these types of technology such as CMDs, however, studies have focused on common benefits, costs, and behavioral patterns (e.g. immediate responses to emails). Missing, though, is an exploration of how users' experiences and reactions may differ.

Since little research has been conducted on CMDs, we conclude that a more exploratory approach is most appropriate. The rest of this article is organized as follows. After methods are discussed, we present and discuss findings that emerge from data analyses, including different reactions to responsiveness and accessibility pressures and factors behind these various reactions. Finally, we highlight the overall contributions, limitations, and avenues for future inquiry.

Methods

As previously stated, our ultimate goal of this exploratory study is to better understand how working individuals who use CMDs for work-related purposes experience and react to this popular connectivity technology. To accomplish this, we adopt a grounded theory-informed approach that has been described as 'an iterative process by which the analyst becomes more and more "grounded" in the data and develops increasingly richer concepts and models of how the phenomenon being studied really works' (Ryan and Bernard, 2000: 783). More specifically, we use a qualitative, inductive approach to our data collection and analyses.¹ An inductive approach (Glaser and Strauss, 1967; Strauss and Corbin, 1998) and use of qualitative methods are particularly appropriate when searching for meanings, examining phenomena that may not be well understood, and in generating propositions (Maxwell, 1996; Miles and Huberman, 1994), as in this case of understanding this technology. We start our analyses inductively by analyzing participant narratives about their CMD use.

Data were collected by interviewing 54 working individuals who are also CMD users from a number of cities in the USA.² Since we are interested in working individuals who use their CMDs for work purposes, we did not actively solicit participation from individuals who use their devices only for non-work purposes or individuals who have limited work responsibilities such that a CMD would not be relevant to their work. The study participants work in organizations across a range of sectors including finance, retail, higher education, and real estate holding a wide range of positions including chief executive officer, founder, senior vice-president, director, consultant, manager, and some lower-level positions. The length of time being a CMD user, age, gender, and marital status greatly varies across study participants.³

Participants were asked to describe their experiences with their CMDs. These in-depth interviews were semi-structured (Fontana and Frey, 2000), conducted either face-to-face or over the phone lasting 40–70 minutes, audio-recorded, and then professionally transcribed. In keeping with a grounded theory-informed approach, data collection was an iterative process where the interview protocol was updated at several points throughout

the interview process as we analyzed the key findings throughout the collection of our interview data (using the methods described below). Some of the key questions we asked participants throughout the study included: (a) 'When and how do you use your [insert device name, such as BlackBerry, Treo or iPhone]?'; (b) 'How (if at all) has using the [device name] changed your work style and routines? Work style of your group and/or company?'; (c) 'When you are "notified" by your [device name], what is your immediate reaction?'; (d) 'Are there norms, expectations or rules about when to use it? Are they formal or informal? How might having [device name] change your expectations about how others communicate with you?'; (e) 'What (if any) are your personal rules/boundaries for [device name] use?', and (f) 'What made you decide to get a [device name]?'. In keeping with an inductive approach to inquiry, these open-ended questions were designed to allow participants (in a non-guiding way) to discuss any qualitative aspects related to expectations and experiences, reactions to their experiences, and possible explanations for different user reactions.

In our analyses, we focused on interviewees' responses to these questions. Their narratives were segmented into thematic 'thought' units.⁴ These thought units are main ideas contained in a phrase, sentence, or paragraph and are the basic unit of analysis in this study. The authors generated a coding scheme based on each author's holistic reading of all transcripts. This coding scheme was then applied to each interview transcript by open coding the data (Ryan and Bernard, 2000; Strauss and Corbin, 1998). A sentence or paragraph was given two or three codes if it contained more than one idea. When the codes were not sufficient (e.g. some categories needed to be subdivided or refined), all transcripts were re-coded based on the revised coding scheme. Our analyses resulted in the coding of 3829 thought units across interviews. A second coder conducted 'check-coding' for approximately 50 percent of the data, which 'not only aids definitional clarity but also is a good reliability check' (Miles and Huberman, 1994: 64). The inter-coder reliability was 92.9 percent prior to discussion and 98.2 percent post-discussion (Holsti, 1963). Each theme, category, and subcategory had letter codes and descriptions (coding schemes, descriptions and exemplars are included as Tables 1–3).

To determine relationships among concepts, we compared and contrasted the themes and categories using a technique known as 'constant comparison method' (Becker, 1998; Glaser and Strauss, 1967; Strauss and Corbin, 1998), which assists in determining 'when, why, and under what conditions do these themes occur in the text' (Ryan and Bernard, 2000: 783). We applied constant-comparison-method techniques when we compared participant responses to common questions posed in the interviews, grouped those answers into categories, and then analyzed the different perspectives on a particular topic. To facilitate this process, we used a technique known as 'memoing' (e.g. writing code and theory notes) (Strauss and Corbin, 1998) to record the relationships among themes and categories. The results from these on-going analyses were also used to refine the questions we asked throughout the interview process and to guide the selection of respondents for our study. Through these rigorous processes, we were able to move beyond description of the data and 'generate assertions' (Erickson, 1990) about users' experiences with their CMDs and reaction to these experiences.

Using the analyses techniques described above, themes related to users' reactions to their experiences emerged. These include how CMD technology is interpreted and put

into practice (Table 2). By analyzing these specific themes collectively using a constant comparative method, three different combinations of interpretations and behavioral patterns emerged from the data. We describe these combinations as 'reaction categories,' and they are described in more detail in the results section. Subsequently, three separate coders (the two authors and one independent coder) independently analyzed the coded reaction themes for each of the 54 interviews and then independently classified each user reaction into one of the three reaction categories. The three coders compared their reaction classifications for the 54 study participants. The inter-coder reliability for reaction-category classifications was 90.7 percent prior to discussion and 96.3 percent post-discussion (Holsti, 1963). The reaction categories and users representative of each category can be found in Tables 2 and 3.

Results and discussion

As previously stated, the initial purpose of this study is to provide insights into: (a) how working individuals who are also CMD users experience this contemporary type of connectivity technology; (b) how users react to such experiences; and (c) if and how users' experiences and reactions differ. In addressing our objectives, we organize findings into two main sections. Echoing other research (e.g. Mazmanian et al., 2006; Orlikowski, 2007), our analyses reveal that users in this study experience pressure to be responsive and accessible. While users report similar experiences in terms of expectations, their reported reactions to such pressures differ.

It is worth noting that our analyses do not reveal findings related to differences across demographic and other individual-level variables. The data were analyzed looking for ways users' experiences may differ based on variables such as age, gender, marital status, relative rank of position within the organization, level of autonomy in one's position, and out-of-office job requirements. We are quite surprised to find that these variables did not account for differences.

Expectations to be responsive and accessible

As discussed in the introductory section, one of the primary attractions of CMD technology is that it connects a user to many different people and information sources via email, internet, text messaging, and phone functions. At least one of these communication features (and typically multiple features) is commonly used by all study participants. Owing to the functionality of technology, it is not surprising that the overwhelming majority (78%) of the interviewees choose to discuss experiencing expectations of responsiveness and accessibility.⁵ Experiencing pressure owing to these expectations is explicitly and repeatedly discussed throughout the interviews with 109 different incidents described by participants. The responsiveness pressure is described by participants as the expectation the user will respond quickly to a message after receiving it. Along the same lines, participants describe the accessibility pressure as an expectation that a user will make time to check and respond to messages, regardless of time of day, day of the week, where someone was, or what s/he was doing. An IT company executive explains:

With voicemail, it was always acceptable to say, 'I'll return your call ASAP, at the latest by the end of the business day.' With the BlackBerry that's no longer acceptable. The response is expected immediately . . . So instead of it being okay to respond at the end of the day, it's really expected in an hour or two maximum. It's dramatically changed the approach to the business day and business overall.

One user in the computer-industry states 'having a Blackberry is synonymous with being on-call.' Participants report expectation sources of these pressures coming from those inside their organizations (e.g. supervisor, coworkers) and outside their organizations (e.g. those in industry, general society, other CMD users, family/friends, self).

How users react to responsiveness-accessibility expectations

In analyzing data related to users' reactions, we find differences in how the technology is interpreted and put into practice. In other words, users' interpretative schema/frames and enactment practices vary in this study. With regard to enactment, their use patterns differ in terms of boundary-setting behaviors, which include: (a) whether or not they always keep their device on, and (b) whether or not they describe using specific strategies to actively manage their CMDs. Related to interpretative schema, the way users frame their interpretations around personal and professional costs and benefits differ. For example, some users report benefits that range from personal benefits such as psychological (e.g. peace of mind, less anxiety) and social (e.g. being more connected to others) to professional benefits related to work quality (e.g. increased efficiency, responsiveness, accessibility, and productivity). Some participants describe costs ranging from personal costs such as psychological (e.g. stress, guilt) and social (e.g. objections from others) to professional costs (e.g. decreased efficiency, being distracted).

Users' reactions (i.e. interpretation of benefits and costs combined with boundary-setting practices) cluster into three general categories that we refer to as 'enthusiastic,' 'balanced,' and 'trade-offs.' We identify 27 percent of the participants as having enthusiastic reactions, 31 percent balanced reactions, 41 percent trade-offs reactions, and 1 percent could not be classified because the individual used the device in an unusual way.

Users identified as having enthusiastic reactions frame their CMD experiences in positive terms reporting numerous personal and professional benefits. Embracing the pressures to be responsive and accessible, these users' enactment patterns include frequent use, having their devices always on and nearby in order to monitor them.

Users with balanced reactions interpret their experiences differently, appreciating the benefits of CMDs but also recognizing the potential downsides (both personally and professionally) of experiencing pressure to be responsive and accessible. Therefore, these users' enactment practices include actively setting limits on CMD usage such as turning them off in the evenings and on weekends.

Users identified as making trade-offs have more critical and reflective interpretations of their experiences than enthusiastic reactions, but are less critical and reflective than balanced reactions. Those with balanced reactions discuss the professional and personal costs and benefits, while those with trade-offs reactions discuss experiencing professional benefits and personal costs (i.e. limited to no discussion about personal benefits and/or

Table 1 Expectation sources to be responsive and accessible

CATEGORY (CODE)	Descriptions and example responses
ORGANIZATION (ORG)	<p>63% described organizational sources of expectations; 71% of these mentioned responsiveness and accessibility; of those that did not describe organizational sources, 35% were self-employed or entrepreneurs who set their own expectations</p> <p>(i.e. any source of expectation/pressure that is created by organizational member[s])</p> <p>'Since I have a BlackBerry, they [bosses and co-workers] think that I'm available most of the time and so they will send messages at anytime of the day and . . . expect some response fairly quickly.' [male, start-up in music industry, 35]</p> <p>'The expectation . . . is that you have a BlackBerry and when somebody sends you an email the excuse that "well, I wasn't in my office" is no longer valid. "Okay, so you weren't in your office, but you had your BlackBerry. We pay for that so we can be in touch with you, so we have an expectation of being able to reach you and you being responsive."' [male, consultant, age 48]</p> <p>57% of participants described external sources of expectations; 74% of these mentioned responsiveness/ accessibility</p>
EXTERNAL (EXT)	
1. Industry [ind]	(i.e. any source of expectation/pressure that is outside of the organization)
	'They [suppliers and customers] know that I've got it [a BlackBerry] and they want me to respond faster . . . when people know that you're using it and that you've made yourself more available, they do expect you to be more available.' [male, architect, age 35]
2. Other CMD users [user]	'Just to make it clear that if you're going to have a BlackBerry, you have your BlackBerry with you. It means you're on-call. It's like you're a doctor and it's like I'm on-call this week . . . I do give an "x" amount of time for a response. But I draw conclusions if I don't get a response from a BlackBerry user.' [male, business development consultant, age 43]
3. Society in general [scty]	' . . . they all know that I have this little device, [so] they expect me to answer them immediately. So for instance, if someone sends me an email, they know that I've seen that email – that I've gotten it. So they are waiting on my reply . . . So if the person on the other end who knows you have this thing in your hand, they assume that as soon as they hit the send button that you've received it and you've fully read it and they're waiting on your reply.' [female, executive assistant, age 36]

Table 1 (Continued)

CATEGORY(CODE)	Descriptions and example responses
FAMILY & FRIENDS (F/F)	<p>24% discussed family and friends as sources of expectations; 15% of these were specific to responsiveness/ accessibility</p> <p>(i.e. any source of expectation/pressure that is created by non-work related people such as family and friends)</p> <p>'I use it a lot with friends usually when I'm out. With friends, it's more common than anything so there's an expectation that someone should get back to you quickly from a friend standpoint, which is sort of humorous. Similar to co-workers that know you use it religiously. There's an expectation of them to get back with you in a few hours.' [male, real estate developer, age 33]</p> <p>'My sphere, my friends, my family, my loved ones have been kind of trained on how I operate. So I find that if people need something from me . . . they send me emails instead of actually calling, which is a lot more "right now." . . . So my girlfriend, for example, will normally send me a quick email and she knows I'll get right back to her.' [male, bank branch manager, age 28]</p>
SELF AS SOURCE (SELF)	<p>81% of the participants described themselves as sources of expectation</p> <p>(i.e. self as source of expectations)</p> <p>'I might be sitting up in bed or turning off the alarm and then I get up and then check for emails first thing. Check to see if there's anything I need to respond to . . . it's a habit.' [male, bank senior vice president, age 37]</p> <p>'My superiors here don't expect me to be that connected . . . but for me, I want to be responsive. They [my employer, customers] don't expect an immediate response, but I like to respond quickly.' [female, career counselor, age 42]</p>

Table 2 Categorization of users' reactions

CATEGORY (CODE) [sub-code]	Descriptions and example responses
ENTHUSIASTIC (ENT) <i>Benefits and costs</i> professional benefits [pro.ben] personal benefits [per.ben] no costs [no.cst] <i>Boundary-setting behaviors</i> always on [on] / turn off [off] strategy to manage it [str] no management strategy [no.str]	27% of the study participants are identified as having an 'enthusiastic' reaction. Interpretative schema: Professional and personal benefits & no costs 'The greatest advantage is having access to all my information at all times and having the ability for people to get in touch with me at all times or for me to get in touch with them. I don't think there's really a downside.' 'I love mine.' 'I'm a big fan. Everybody should have one.' Technology into practice: Lowest % of participants to engage in boundary-setting behaviors 'I have it on 24/7.' 'I rarely take my eyes off the screen.' 'No, I don't have any [personal rules or boundaries], I check it all of the time.'
BALANCED (BAL) <i>Benefits and costs</i> professional benefits [pro.ben] personal benefits [per.ben] professional costs [pro.cst] personal costs [per.cst] <i>Boundary-setting behaviors</i> always on [on] / turn off [off] strategy to manage it [str] no management strategy [no.str]	31% of the study participants are identified as having a 'balanced' reaction. Interpretative schema: Professional and personal benefits & professional and personal costs 'There are definitely a lot of positives [being responsive], but there's some negatives. You know people just being so consumed by these things, they're not necessarily as focused on the immediate context that they're in and not necessarily picking up all perhaps they should be in a conversation or in a meeting.' Technology into practice: Highest % of participants to engage in boundary-setting behaviors 'I'll turn it off for the weekend.' 'I check it on a regular basis [a few times a day] but not compulsively.' 'You can start imposing limits on it so it serves you than you sort of serving it.'
TRADE-OFFS (T.R.O) <i>Benefits and costs</i> professional benefits [pro.ben] personal costs [per.cst] <i>Boundary-setting behaviors</i> always on [on] / turn off [off] strategy to manage it [str] no management strategy [no.str]	41% of the study participants are identified as having a 'trade-offs' reaction. Interpretative schema: Perceived professional benefits & personal costs 'The greatest advantage is the flexibility . . . you can receive important emails anywhere just about any time . . . The greatest disadvantage is the same thing. It is an awfully intrusive device [in non-work] . . . it makes it much more difficult to escape from thinking about work.'
<i>Boundary-setting behaviors</i> always on [on] / turn off [off] strategy to manage it [str] no management strategy [no.str]	Technology into practice: 2nd highest % of participants to engage in boundary-setting behaviors 'It's always on.' 'There is a little Pavlovian response to the red light but there are times when I don't need to be responding or checking. I pride myself on doing that [not always checking it].'

professional costs). While they appreciate the work-related benefits, those with trade-offs reactions report that the pressure to be responsive and accessible frequently interferes with their personal lives. Consequently, while these users may want to set boundaries to reduce personal costs, they frequently find themselves conflicted (owing to the number of perceived professional benefits) and therefore struggle to actively set CMD-usage boundaries. These categories of reactions are described in more detail below.

Enthusiastic reaction Those in the enthusiastic category interpret their experiences in an extremely positive light, describing personal and professional benefits and no costs. The only downsides described by a few of these users are related to limitations of the device itself. This is reflected in comments first by a real estate executive and then a director of university alumni:

It saves time . . . I think it has increased my productivity. The greatest advantage is . . . multi-tasking. I think it is a very good productivity device . . . I would like them [the manufacturers] to sort of fool proof them, but, all in all – magic toy.

The biggest advantage is that I have this comfort level that I know that I'm always gonna be connected . . . you know I hate to feel I'm missing something. I hate that feeling. Biggest disadvantage, it doesn't do everything I want it to do.

Moreover, users in this category do not report needing to set boundaries to manage the device because they do not perceive any downsides for users.

On the contrary, these users put this technology into practice by always keeping their devices on and constantly monitoring them. Many users even describe having an 'involuntary' or 'automatic' response to message notifications (e.g. 'Sort of like Pavlov's dog – I'll pick it up and look at the message [when it pings]'). This Pavlovian reaction is illustrated by a business-development consultant using humor to describe how he reacts to message notifications:

Well, I got a new little device. It's like a pace maker that is now implanted in my chest. It's connected to my BlackBerry and when it vibrates it actually sends about 5000 volts right through my whole body. That's not true, but that's about how it works with me. So the vibration causes an automatic response. I pick it up. I look at it. I'm at attention.

Balanced reaction Those with balanced reactions have more holistic interpretations of their experiences, reflected in cost-benefit comments by users like this external relations director:

The biggest advantage is far more frequent, rapid responses to largely business-related inquiries and the ability to do that in a very convenient way. Clearly the negative is there are some expectations. I know if my coworkers didn't get a response from me . . . they'd be like, 'Geez, what's he doing at 11:00pm? Why isn't he responding to my emails?'

This person experiences great benefits but also acknowledges significant costs with regard to the pace of work that developed as a result of using the device.

In addition, these individuals put the technology into practice by setting boundaries (i.e. not always having their CMDs on and actively managing their device) such as this IT consultant:

From a personal perspective, it's a lot about setting limits. It's really easy to start reading email and get sucked into responding to people. It can start eating into your personal time. I'll check to see if there are burning issues. They have to be red-hot-on-fire before I'm going to take some of my personal time to deal with it on the weekend or at night.

Similarly, a university administrator manages her device: 'I do turn it off and on. Late night I won't get a call, I won't get an email. I set the sound thing [off], I don't want the machine making a sound that indicates I have to respond.' Unlike those in the enthusiastic category, those in the balanced group do interpret personal and professional costs associated with pressures to be responsive and accessible. These users have a balanced perspective of the technology, wanting to mitigate potential costs. To do so, their enactment practices include actively setting limits on CMD usage such as turning them off in the evenings/weekends and routinely not checking them.

Trade-offs reaction Interpreting their experiences as mixed, these users report professional benefits with significant personal costs (i.e. limited to no discussion about professional costs and/or personal benefits). An aviation employee comments:

The greatest advantage is being connected; it helps me to keep up on my workload. Disadvantage is being connected – of always being at work basically to some degree. My family having to sit around while I'm responding to emails.

Like the balanced group, trade-offs describe wanting to set boundaries to mitigate personal costs. In contrast to the balanced group, though, they frequently feel conflicted (owing to the number of perceived professional benefits) and therefore struggle to stick with CMD-usage boundaries like this senior vice president:

I have recently instituted a time-management strategy for personal balance. The BlackBerry is left at home when I want to be left alone . . . I can't live without it and I can't live well with it. The difference between today and the past is you have to do so much. So it's a great tool to leverage your efficiency. Problem is I don't have the self-control to turn it off, and therefore, I hate it because I don't have the self-control to leave it off.

Like the enthusiastic group, trade-offs tend to put the technology into practice by consistently monitoring it and keeping the device on; however, unlike enthusiasts, they want to control their behaviors but often struggle at this. For example, an executive explains that he feels he is at war with his BlackBerry, information flowing faster than he can keep up with: 'I described email today as something that just extends the battlefield. As the equivalent to being in World War I in the trenches, the bullets are flying non-stop. There's just a hail of bullets coming at you all the time.' Those with trade-offs reactions often find themselves battling their devices, struggling with the expectations or pressures from others, and making trade-offs (i.e. personal costs in exchange for professional benefits).

Factors influencing different reactions

While it is perhaps not surprising that participants report experiencing responsiveness-accessibility pressures, users' reactions do vary as described above. Subsequently, additional analyses were conducted to determine what factors contribute to the different reaction categories. More specifically, within each of the three reaction categories, we looked for themes that emerged that further distinguished users' reactions in each of the three categories.

Three factors emerge as influencing users' various reactions, which include: (a) number of expectation sources users report; (b) the specificity of the expectation sources (i.e. the ratio of less-specific vs. more-specific sources); and (c) the reasons why a user adopts a CMD. Examples of users who are representative of each category can be found in Table 3.

Number of sources In our study, the number of expectation sources is not the same for all users. This technology allows for variation in the number of constituencies with whom a user is connected, including those internal and external to organizations (Table 1). The number of actors exerting pressures, in turn, is one influential factor contributing to user reactions. Grounded in data, those subject to expectations from a larger number of sources appear to be more heavily influenced by responsiveness and accessibility pressures than those who have reported fewer expectation sources. For example, enthusiastic-reaction users report the highest number of expectation sources, followed by trade-offs, and balanced with the fewest number of reported sources. One likely explanation for how the number of sources influences reactions is that the effect is additive – a greater number of sources, leads to increased feelings of pressure, resulting in enthusiastic and trade-offs users putting the technology into practice by keeping the device always on and constantly monitoring it. For balanced-reaction users, fewer sources lead to fewer feelings of pressure, resulting in enacting boundary-setting practices.

Specificity of sources In our findings, those who experience pressures from specific, identifiable sources (i.e. a supervisor, self, friends and family) have different reactions than those experiencing pressures from less-specific, more-diffuse sources (i.e. industry, CMD-user community, and society in general). While users in all three reaction categories report both types of sources, the ratio of less-specific vs. more-specific sources varies and appears to influence reactions. Those in the enthusiastic category report the highest ratio of less- vs. more-specific users; in other words, pressure comes more from less-specific, more-diffuse sources such as CMD-user community or society rather than specific, identifiable sources. Those in the trade-offs category report approximately an equal number of less-specific and more-specific sources. Meanwhile, the balanced group reports the lowest ratio of less- vs. more-specific sources; in other words, they experience pressure from more-specific sources such as supervisors, particular coworkers, and friends compared with less-specific sources.

One explanation for these findings is that users experience less-intense pressure to be responsive and accessible when actors are more specific and identifiable because they are more predictable and it is easier to manage their expectations. Counterintuitively, users experience more intense pressure when sources are less specific and more diffuse because it is harder for users to predict and manage these actors' expectations. Therefore,

Table 3 Contributing factors to ‘enthusiastic,’ ‘balanced,’ and ‘trade-offs’ reactions

TYPE OF USER [CODE] Source, Motive, Behaviors	Descriptions and responses [sub-codes]
ENTHUSIASTIC (ENT): most # of sources; highest ratio of ‘less-specific’ vs. ‘more-specific’ sources; mimetic motives; no/few boundaries Enthusiastic reaction #1: Director of alumni relations at a large university (outreach and event planning) (female, 45) Sources: alumni, donors, vendors, anyone Motive: mimetic (choice) Behaviors: no strategies to set boundaries	Alumni such as ‘a sales person or someone in a CEO position,’ ‘donors,’ and vendors to help with events. ‘People that are trying to get a hold of [her] for some reason and they can’t.’ [many sources] [less-specific] She got one because it ‘came highly-recommended by everyone who had one’ such as her husband. [mimetic] She states: ‘when I leave my desk, I take it with me everywhere . . . I have it “on” all the time – at home during the weekends.’ ‘I’m pretty much on it all of the time . . .’ [none]
Enthusiastic reaction #2: Consultant to private equity firms (former investment banker) (female, 38) Sources: customers, staff, family, friends Motive: mimetic (choice) Behaviors: no strategies to set boundaries	‘Everyone . . . potential customers, current customers, internal people’ [many sources] [less-specific] ‘Family, friends, husband’ [more-specific] She ‘chose to get it on [her] own for [her] business.’ She ‘cover[s] the costs.’ [mimetic] She says: ‘I have it on 24/7 no matter what day of the week it is. It is “geekily-cool” to return an email at 11 pm . . . I don’t think anyone can set rules on BlackBerry use. Don’t want to use it, then don’t get one.’ [none]
Enthusiastic reaction #3: Lawyer for a commercial litigation firm (female, 33) Sources: industry, clients, friends, family Motive: mimetic (choice) Behaviors: no strategies to set boundaries	‘Attorneys’ in the industry, her ‘clients’ [many sources] [less-specific] Her ‘boyfriend,’ ‘six girlfriends from college’ [more-specific] ‘Everyone was getting them, and it just seemed like having my email accessible was a great idea.’ [mimetic] She claims: ‘I use it all of the time . . . when I am out doing errands, on the weekends, at night . . . I’m one of those addicts.’ While she does have it on when ‘out with friends,’ she does turn it off when ‘asleep.’ [few]
BALANCED (BAL): fewest # of sources; lowest ratio of less-specific’ vs. ‘more-specific’ sources; coercive motives; sets boundaries Balanced reaction #1: Director of business systems in a manufacturing firm (male, 46) Sources: his employees Motive: coercive Behaviors: uses strategies / sets boundaries	The ‘introverted-technical types’ that work for him. [few sources] [more specific] His company ‘pays for all of the costs.’ ‘Having one is part of the standard’ for managers like him. [coercive] He sets boundaries by ‘having rules about responding to emails,’ ‘putting it away on Saturdays,’ and ‘having rules about responding to emails.’ [strategies]

Table 3 (Continued)

TYPE OF USER [CODE] Source, Motive, Behaviors	Descriptions and responses [sub-codes]
Balanced reaction #2: Geological engineer for a large civil engineering firm (female, 29) Sources: manager, family Motive: coercive Behaviors: uses strategies / sets boundaries	She communicates mostly with her 'manager' and 'brother.' [few sources] [more specific] She has a BlackBerry for her 'job.' She does 'not pay for it; the company covers all of the costs.' [coercive] She claims: 'I have my BlackBerry set up to turn off at 11:00pm and turn back on at 7:00am.' She removes 'sent from a BlackBerry' tag line because she 'doesn't want everybody such as vendors or sub-contractors to know [she] has a BlackBerry' to prevent assumptions that she will respond. [strategies]
Balanced reaction #3: Computer technician for a global computer processing company (male, 35) Sources: his customers Motive: coercive Behaviors: uses strategies / sets boundaries	He interacts with 'a particular customer or a group of customers.' [few sources] [more specific] His BlackBerry is 'required by [his] work.' His company 'pays for everything.' [coercive] He states: 'I only use my BlackBerry just when I really need it,' and 'I check my emails manually [instead of pushing all emails through automatically].' [strategies]
TRADE-OFFS (TR.O): 2nd most # of sources; similar ratio of 'less' vs. 'more-specific'; coercive motives; uses strategies, few boundaries Trade-offs reaction #1: Vice-President for a commercial bank (male, 38) Sources: clients, industry, partners, fam/fr Motive: coercive Behaviors: uses strategies / few boundaries	'A lot of clients,' 'new prospects,' 'marketing groups' & 'lending' folks. [many sources] [less specific] 'Partners & assistant,' his 'wife who travels a lot,' and 'of course friends.' [many sources] [more specific] 'Senior management [like himself] all have one [BlackBerry].' 'Company pays for all expenses.' [coercive] He states: 'I will turn off the ringer if I'm going into a conference or a meeting with a client.' [strategy] 'I check it because I am afraid of missing something . . . What do I need to know? What is it? Is it a client? New deal? Emergency? It's like having the mailman drive by and put something in your box. I have this sense of urgency to see what it is.' 'My wife tells me to put it down if we're having dinner.' [few boundaries]

(Continued)

Table 3 (Continued)

TYPE OF USER [CODE] Source, Motive, Behaviors	Descriptions and responses [sub-codes]
Trade-offs reaction #2: Associate director of development (corporate relations, fundraising) (female, 32) Sources: potential donors family, staff Motive: coercive Behaviors: uses strategies / few boundaries	<p>She interacts with potential donors and says it is exciting to see if you got the big one [donor].’ [many sources] [less specific] ‘My parents [who] are living in Brussels.’ ‘My assistant’ [more specific]</p> <p>She states: ‘I was given one by my employer.’ ‘They pay all costs.’ [coercive]</p> <p>She describes her strategy: ‘I have it on vibrate – no bells and whistles going off all of the time.’ [strategy]</p> <p>She describes ‘complication with the work-life-family balance’ as a disadvantage. She says: ‘I have a weird need to look at it when it’s not necessary. My job is usually not that urgent.’ ‘I’ve felt guilty for looking at it when I know I shouldn’t.’ ‘My husband wanted to take it away from me the whole vacation.’ [few boundaries]</p>
Trade-offs reaction #3: Business line executive for a communications firm (male, 49) Sources: industry, clients, family Motive: coercive Behaviors: uses strategies / few boundaries	<p>‘Customers from around the world’ and ‘people within the industry.’ [many sources] [less specific]</p> <p>He states: ‘if I am in China, my family can immediately reach me.’ [more specific]</p> <p>He explains: ‘the company that I work for, it’s kind of a requirement’ to have a BlackBerry. [coercive]</p> <p>He has ‘set some strict rules’ for himself and others ‘to keep BlackBerries out of sight at customer meetings.’ [strategy] He struggles at home ‘to disengage from work.’ Trying ‘to give the appearance of being connected to his family,’ he describes his use – going to the bathroom to check it – as ‘surreptitious.’ [few boundaries]</p>

enthusiastic users experience the highest ratio of less-specific, more-diffuse sources, resulting in more pressure possibly owing to the unpredictability-surprise factor that leads users to react by constantly monitoring their devices. With the lowest ratio of less-vs. more-specific sources, balanced-reaction users experience less pressure and regularly enact boundary-setting tactics. Since the trade-offs category report approximately an equal number of less-specific and more-specific sources, it makes sense that they both monitor the device regularly and enact some boundary-setting practices. This explanation is consistent with Foucault's classic work (1995) on panoptica that suggests greater adherence to expectations is likely to increase with more anonymous, unknown observers because of their unpredictability and possession of power to surprise.

CMD adoption motives Adoption motives (i.e. why a user has a CMD) also emerge as factors contributing to users' reactions. These motives include technical (i.e. desired technical functionality), mimetic (i.e. imitation of others who have the device), and coercive (i.e. rules or requirements from external resource providers, such as the employing organization).⁶ While, not surprisingly, most participants describe adopting this technology because of its technical functionality, additional adoption motives (i.e. mimetic or coercive) differ and appear to be influential in the interpretations of overall costs and benefits of the technology.

Those with enthusiastic reactions report mimetic motives at much higher rates than the other users; in addition, they are least likely to have users reporting coercive adoption. Enthusiastics explain that they adopted CMDs based on their observation of other CMD users and their recommendations; therefore, they thought it would be useful to have. Most of the individuals in the balanced group and many in the trade-offs group report that they adopted the technology because it is required by their employer (i.e. coercive adoption motive).

Since the majority of those in the balanced and trade-offs categories adopt the technology because of employer requirements, it is not surprising that their reactions to responsiveness pressures include negative aspects; these users' interpretative schema incorporate costs to the user. On the contrary, for enthusiasts, decisions to adopt CMDs are not organizationally-mandated, but rather personal choices. Therefore, it makes sense that enthusiastic-reaction users' interpretative schema focus solely on benefits; they do not interpret any user costs or downsides.

In sum, it appears that adoption motives are more salient in shaping users' interpretative schema associated with costs and benefits of the technology. Meanwhile, the number and specificity of expectation sources appear to be more influential in driving use patterns.

Contributions and implications

Our study contributes to technology and work research that focus on social influences and technology use. We find that the characteristics of this technology – meaning that it facilitates rapid access to information and people inside and outside the organization, rather than facilitating a fundamentally different way of completing a set of work tasks – lead to

a different set of factors that shape user interpretations, enactments, and reactions, compared with most prior research on technology and work.

Consistent with prior technology and work research, we find that those with whom users interact often influence how a technology is interpreted and put into practice. However, our investigation of working individuals' experiences with CMDs unexpectedly reveals that social influences extend beyond organizational influences to include those external to organizations such as family, friends, industry, CMD-user community, and society in general. More specifically, we identify important sources of heterogeneity in user reactions to this technology (i.e. number of sources, specificity of sources, and adoption motives), a number of which are outside the direct control of the organization.

The finding that external influences play a significant role in shaping users' reactions and use patterns is important because most prior work primarily looks at instances whereby the organization plays a central role; the organization makes an adoption decision and then users respond often based on influences emanating from within the organization. This technology is different in that the organization is not necessarily in the central role. Adoption decisions can be made by individuals or organizations. Also user interpretations and enactments are shaped by forces internal and external to the organization. Thus, our findings have different implications for the role of the organization in adopting this technology and how the employee-employer relationship is shaped by this technology.

In addition to deciding whether or not to adopt this technology, organizations are faced with decisions such as: (a) whether to promote or react against the responsiveness-accessibility norms associated with this technology, as those within the organization may make their own decisions about adopting the device; (b) what type of user reaction (i.e. enthusiastic, balanced, or trade-offs) the organization wants to encourage; and (c) how the organization can shape their members' interpretations and use patterns when non-organizational actors are just as, if not more, influential. If an organization wants users to react as enthusiasts do (i.e. constantly monitoring device without setting boundaries), one alternative is to create an environment where: (a) the organization is regarded as a more diffuse, less-identifiable entity (shifting the focus from specific organizational members such as one's manager) and (b) the norms include organizational expectations that CMD users are to be available to anyone in the organization at almost any time. In contrast, if an organization wants to promote responsiveness and accessibility but with limits on usage, the organization may want to consider creating an environment where balanced reactions (e.g. setting limits and boundaries on CMD usage) are viewed as acceptable and are encouraged. This could be potentially accomplished through more formal channels (e.g. specific usage guidelines, formal meetings designed to address the subject) as well as informal mechanisms (e.g. creating norms where constant monitoring is not expected and frowned upon, having senior management act as role models by not monitoring their CMDs over the weekends, late at night, or on vacations). Thus, the organization's key decision may not be whether to adopt this technology or not, but rather how to manage norms of responsiveness and accessibility that are shaping interpretations and behaviors in the work place through mechanisms that may be beyond the control of the organization.

Our study makes a further contribution by providing insights into how the employer–employee relationship is shaped by this connectivity technology that extends the range of influence on users. Like other connectivity technologies, this device allows users to connect to many different people; however, how many people and with whom a user interacts is not uniform across all users. These differences partially account for variation in reactions. Discussed above, one explanation for this finding is that users experience less pressure to be responsive and accessible when actors are more specific because they are more predictable and it is easier to manage the expectations of someone you can identify. Users experience more intense pressure when sources are less specific or more diffuse because they are less predictable and it is more difficult to manage their expectations if they are hard to identify. Thus, our results are consistent with panoptica research in that the more anonymous and less specific the source is, the greater the adherence to norms for desired behavior (Foucault, 1995). Counterintuitively, while specific sources (e.g. supervisors in an organization, which is the focus of much prior research on panoptica) play a role in shaping experiences, it is sources that are more difficult to identify – often those outside of the organization – that appear to play a larger role in shaping reactions to the device. This suggests that when the employer encourages using this device for all purposes, not just organizational-specific interactions, the organization is encouraging the highest degree of responsiveness and accessibility. While we do not systematically examine factors such as work intensification in this study, more respondents report spending more time on work-related tasks as a function of using this device than those who report spending less time on work-related tasks. Thus, this technology has the potential to be a tool whereby employers can have employees on call almost all the time. Though outside the scope of this study, our results suggest that, ironically, the more the employer opens up users' device use to sources it does not control, the more control it may exert in terms of promoting norms of responsiveness and accessibility. Future researchers may want to examine these dynamics more explicitly.

Our findings also contribute to technology and work research by providing an alternative way to explore the role of adoption motives. Prior studies emphasize how those close to a user can influence the formation of values and beliefs surrounding technology adoption (Karahanna et al., 1999) and shape a users' initial perceptions of the technology (Fulk et al., 1987; Rice and Aydin, 1991). Building on this research, reasons for adoption emerge as an influential factor in the type of interpretative schema used by the participants in framing overall costs and benefits. If the choice to adopt a technology is a personal one like it is for the enthusiastic-reaction users in this study, it makes sense that they would more likely frame their experience in a positive light, focusing on the benefits. If users have no choice and are required to adopt a technology like balanced and trade-offs, they will more than likely interpret their experience through a lens that captures negative outcomes or costs. We encourage future research to examine other ways individuals' adoption motives may influence interpretations and possibly enactments of connectivity technology.

As nontraditional work arrangements become more prevalent, so will the use of devices such as BlackBerries, Treos, and iPhones that enable flexible, mobile work arrangements to be effective. Our research contributes to the important body of research on connectivity technologies and the relatively limited body of research on CMD

technology. Our findings build on and extend beyond prior research focused on common benefits, costs, and behavioral patterns (e.g. responding to emails immediately). The emergent findings suggest that the ways users interpret costs and benefits and put the technology into practice do differ, and these differences can be partially attributed to number and specificity of social influences along with adoption motives. Discussed earlier, the material aspects of this technology, convenient size and functionality of the device, enable users to conduct a range of work tasks and to quickly and easily connect with many different people and information sources from almost any location. To extend our knowledge and better understand how this technology is interpreted and put into practice, this study illustrates a need to further examine the way social context and influences have typically been conceptualized in technology and work research. Our research provides support that future research should examine how different actors socially influence how users put connectivity technology into practice, including actors inside as well as outside of the organization's boundaries.

Limitations, future research, and concluding remarks

In addition to the suggestions for future research above, we encourage others to investigate connectivity technologies in the context of traditional and nontraditional work arrangements and consider our findings when conducting such research. We recognize that as an exploratory study our research has a number of limitations (which we have chosen to address primarily in terms of areas for future research). While our sample is a respectable size for conducting interviews and study participants were diverse in terms of age, position in organization, type of industry, etc., it does not allow us to assess whether the highlighted findings are necessarily representative of the overall population of CMD users, especially those who use the technology solely for non-work purposes. For example, those who use their CMDs only for personal matters may have a reaction that is not reflected in one of the three emergent reaction categories described in this study. Future scholars should consider assessing our key findings (along with exploring new paths such as different reaction categories) with a larger sample, including those who use CMDs for work and non-work purposes, as well as a broad cross section of users with multiple adoption motives and subject to a range of expectation sources.

This study's findings inductively emerge from data (i.e. participant narratives) collected at one point in time. Therefore, another limitation is the cross-sectional nature of the data. Hence, there is a need for future research that is longitudinal in nature. Longitudinal studies could provide a more thorough understanding of how users' interpretations and enactment patterns evolve and may even change over time as CMD use becomes increasingly widespread. If future research found that CMD users' reactions do shift over time, which factors contribute to changing reactions is another area worthy of future inquiry.

Our decision to focus on one type of connectivity technology device, CMDs, is also a recognized limitation in terms of the potential generalizability of our results to other types of connectivity technologies. We encourage future research to explore other forms of such technologies as they advance, in addition to studying different types of communication modes that enhance connectivity such as Facebook and Twitter.

Our results also suggest several additional avenues that may be fruitful for future research. While personal demographics did not account for differences in users' reactions in this study, 'self' as a source of pressure did emerge. Therefore, investigating how other individual characteristics that may influence a user's experience is worthwhile. Perhaps the degree of self-awareness an individual has about the potential effects of CMDs (which could be determined by individuals' responses to different scenarios in a controlled setting) may be useful to examine. Those cognizant of the potential downsides may be more prone to managing their devices in comparison with those who have less awareness. Also, those who identify themselves as workaholics may be more likely to embrace strongly pressures of responsiveness because of the importance they place on work and because their self-identities are so closely entwined with work.

In addition, many respondents described this technology as having an impact on temporal aspects related to their work. Time has been identified as playing a noteworthy role in a number of organizational phenomena, ranging from ways temporal structures shape and are shaped by organizational members' recurrent practices (Orlikowski and Yates, 2002) or act as a catalyst for organizational change (e.g. Lee and Lee, 2008) to ways information technologies affect temporality in organizational work (Barley, 1988; Lee, 1999; Lee and Liebenau, 2000). Therefore, investigating how and in what ways CMDs and their users' practices influence temporal structures would be another fruitful area for future inquiry.

As discussed above, unlike many other types of technologies studied in the arena of technology and work, this device does not represent a new way to complete work tasks but rather a more rapid means of being connected to and accessing information and people. A number of respondents did describe how their work behaviors and routines have changed to a more instantaneous style since adopting a CMD. More specifically, users reported they are driven toward responding quickly to messages; working on tasks in shorter, more fragmented blocks of time; and moving quickly to different tasks or even multi-tasking as opposed to working and focusing on one particular task for a longer period of time. Therefore, future investigations focusing on how this technology influences the way work is done could be worthwhile.

Further, the role the organization plays in shaping adoption by its employees deserves further attention. In the case of CMDs, organizations ironically have less control over adoption, but whether they formally require device use affects user reactions. These devices may be part of a larger management fashion trend whereby tools that hold out the promise of greater efficiency are embraced (e.g. Abrahamson and Eisenman, 2008; Barley and Kunda, 1992; Blumer, 1969); so understanding the organizational perspective on adoption and setting norms may yield interesting insights on the adoption of management fashions in a context where influences beyond a focal employer and employee agency play a relatively larger role.

In closing, as the world of work continues to embrace connectivity technologies that facilitate nontraditional work arrangements, we draw attention to the importance of closely examining how these technologies are interpreted and put into practice. To manage such technologies effectively, both organizations and individuals would do well to pay attention to where pressures to be responsive and accessible come from. Moreover, we encourage future research to examine what strategies both individuals and

organizations could enact to mitigate potential downsides associated with the use of this technology. CMD technology unquestionably allows one to be readily connected to people and information. The unanswered questions are: to what effect – at what point and in what contexts – does being constantly connected hinder quality of life in work and non-work domains and in what contexts does it improve it? And what can individuals and organizations do to integrate connectivity technology effectively into daily life?

Notes

1. In our results, we report frequency data in order to illustrate how common each finding is within our sample. This is consistent with those who argue that a theme is based on the recurrence, repetition, and forcefulness of a concept(s) (Owens, 1984). Since we focused on working CMD users, we do not suggest that these frequencies are necessarily representative of the population of CMD users.
2. Cities include San Francisco and Sacramento, CA; Denver and Boulder, CO; New York, NY; and Houston, TX.
3. Twenty-six percent had used a CMD for less than a year, 46 percent between 1–3 years, and 28 percent for more than 3 years. In addition, 65 percent of our participants were men and 35 percent women; 70 percent were married and 30 percent single. The participants' ages ranged from 20s to 60s; 78 percent were 27–49 years old; 20 percent were 50–65 years old; and 2 percent were under 25.
4. The selection of the 'thought' unit as our qualitative unit of analysis (rather than individual words or phrases) is consistent with those who argue that qualitative analysis is about 'finding your story' (Patton, 2001: 432), which requires a focus on a larger unit of analysis to make sense of participants' narratives. The justification for such an approach is not dissimilar to some of the rationale provided for adopting the think-aloud protocol (Ericsson and Simon, 1993; Pressley and Afflerbach, 1995) or methods associated with it.
5. Respondents were not expressly asked about pressures to be responsive and accessible; rather, 78 percent chose to comment on such pressures as salient.
6. We use terminology from institutional theory that describes forces influencing the adoption of practices, policies, and strategies (DiMaggio and Powell, 1983) to describe adoption motives in our study.

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