Basic Concepts & Definitions

Information and communication technology (ICT) broadly describes the technological platforms (e.g., the Internet) and devices (e.g., mobile phones, computers, personal digital assistants [PDAs], e-readers) widely used by individuals to communicate with others and gather and process information. Reliance on ICTs has grown substantially since the advent of the personal computer in 1981 (Rodman & Fry, 2009). Survey data from 2008 indicate that 62% of American workers are “networked,” meaning that employees regularly use ICT on and off the job (Madden & Jones, 2008). Similar patterns have been found in growing numbers of American families, with the highest household ICT adoption rates to date in married-couple with children households (Kennedy, Smith, Wells, & Wellman, 2008). This entry will briefly review linkages among ICT use and changes in paid work and personal life, as well as the interface between these domains, and will discuss specific implications of these changes for employers, employees, individuals, and families.

Importance of the Topic to Work and Family Studies

The importance of technological innovation in shaping work and family life has a long history, and social science investigations in this area are well-established. For example, in Capital, Marx et al. (1936) devote an entire chapter to a discussion of the role of machinery in industrial systems and thus lay the foundation for a discussion of technologically facilitated “deskilling” that is ongoing with the proliferation of computing technology in organizations (see also Braverman, 1998). The development of technological systems in organizations or the implications of technological innovation for organizational practice continue to be of interest (Bailey & Kurland, 2002; Daft, 1988; Duxbury, Towers, Higgins, & Thomas, 2006; Rotella, 1981), even as the technological landscape evolves.
While assessing the implications of technological innovation for life outside work has, perhaps, been less fertile ground for social scientists, there is also a history of research in this area. Ogburn and Nimkoff (1955) examined how technological innovations like television, radio, and the telephone might influence family life, roles, and public/private boundaries long before the advent of the Internet. With respect to technological innovation and personal/family life, social scientists have examined how earlier rounds of technological innovations altered the performance of domestic labor (Bose, Bereano, & Malloy, 1984; Cowan, 1983; Vanek, 1974), influenced the development of children (Atkin, 2001; Comstock & Paik, 1991), and shaped family relationships (Bryant & Bryant, 2001; Fischer, 1992; Kubey, 1990; Spigel, 1992).

Thus, it should come as no surprise that work-life scholars are interested in understanding how current technological innovations focused on mobile information and communications are shaping and being shaped by-employment and family/personal life. Continuing to understand the role that technological innovation is playing in influencing daily life is, therefore, important for scholars, educators, policy makers, employers, families, and individuals.

**State of the Body of Knowledge**

When Internet technology began diffusing more rapidly in the American population in the 1990s, it was commonplace to hear about the “technological revolution” that was unfolding before our eyes. However, historians of technology are quick to point out that earlier technological innovations like the telegraph were probably more revolutionary in their social impact than the diffusion of the Internet or the mobile phone (Fischer, 1992; John, 2000; Webster, 1995, 2002; Winston, 1998). This is not to say that rapid ICT adoption and use is not important, but it is critical to recognize that such innovations in information and communications are part of a much longer historical trend. One crucial point we can take away from these historical analyses is that various waves of technological innovation have significantly altered the organization of social life.

We begin this section by reviewing research that investigates some of the ways ICT use is changing employment, with a particular focus on links between ICT use and the ability to work outside traditional organizational settings and times. We also review evidence that examines the role that ICT use is playing in changing the amount, density, and pacing of paid work. Next, we review research investigating the influence of ICT use on personal and family life. Here we examine the influence of ICT use on personal relationships, ICT use and children’s development and outcomes, and the relationship between ICT use, family coordination, and time experiences. Our final section outlines scholarship examining the influence of ICT use and shifting public-private boundaries.
ICT and Employment

Current Trends. According to the PEW Internet & American Life Project, in 2008 62% of U.S. workers were "Networked Workers" who used the Internet or email at their workplace (Madden & Jones, 2008). The PEW data also show that using ICT at work increases the likelihood of using ICT in one’s personal life; in fact, networked workers are more likely than the average American to use technology outside of work (Madden & Jones, 2008). These data indicate that ICT use varies by company type and profession. Government workers are the most likely to use the Internet at work, with 72% reporting that they use the Internet several times a day. Other companies with high levels of Internet use are educational institutions (60%) and nonprofits (56%). Taking a closer look at particular professions and ICT use, the PEW data illustrate that almost three-fourths of professionals, executives, or managers use the Internet at work either constantly or several times a day versus about half of clerical, office, and sales workers. Professionals and executives own and use more gadgets such as laptops and PDAs than other workers and tend to use them more frequently both in and outside the workplace. Thus, while it is clear that many employees use ICT to perform their work, work-related ICT use is concentrated in particular industries and occupations and differs by key individual characteristics like age and education level.

ICT and Non-Traditional Work Arrangements. In the late 20th century, scholars identified the prevalence of ICT in the workplace as an important characteristic that would shape where and when we work (Lewis & Cooper, 1999). This led to a number of studies focused on the experiences of workers in “non-traditional” work arrangements that were now possible with the adoption of ICTs and a growing information employment sector (Bailey & Kurland, 2002; Duxbury et al., 2006; Ellison, 1999; Galinsky, Kim, & Bond, 2001; Hill, Ferris, & Martinson, 2003; Hill, Hawkins, & Miller, 1996; Hill, Miller, Weiner, & Colihan, 1998; Hughes & Hans, 2001; Kossek, 2003; Kossek, Lautsch, & Eaton, 2009; Standen, Daniels, & Lamond, 1999). Teleworking is the most commonly referenced non-traditional work arrangement made possible by ICT and can include telecommuting (periodic work outside of the principal office) and virtual or mobile offices (having the portable means to accomplish work wherever it makes sense; Hill et al., 2003; Kurland & Bailey, 1999).

Although it is easy to classify any work done outside of the principal office as teleworking, Duxbury et al. (2006) make a distinction between telework and “technology facilitated work extension,” which they define as “the act of engaging in work-related activities outside of regular office hours in locations other than the business office.” This distinction is important, especially in light of research suggesting the “blurring” of boundaries between home and work that results from ICT use (Chesley, 2005; Haddon & Silverstone, 2000; Lewis & Cooper, 1999) and reports of Americans feeling overworked (Galinsky et al., 2001; Jacobs
As ICT use continues to rise in American workplaces, it is highly probable that work extension and blurring of work-family domains will become more prevalent. Future research identifying where telework ends and work extension begins is warranted.

Tracking who is or should be considered a telecommuter has proven to be a difficult undertaking for a number of reasons, and estimates of telecommuting vary greatly depending on the source. In 2008 almost half (45%) of all workers reported doing at least some work from home, with 18% doing so almost every day (Madden & Jones, 2008). Although the actual number of telecommuters may be debatable, what is clear is that certain types of workers have a higher likelihood of telecommuting than others. We know that the self-employed often work out of their homes (Baines & Geldner, 2003), as do those in the highest-earning occupations (Madden & Jones, 2008). For example, 69% of employed adults earning more than $75,000 report that they work from home some of the time, compared to only 30% of those in jobs earning less than $30,000 a year (Madden & Jones, 2008). These statistics suggest that the option to telecommute may not be equally available to all employees, but is more frequently reserved for those in higher status occupations.

There have been varying reports of the implications of telecommuting for workers (see reviews in Bailey & Kurland, 2002; Kossek, 2003). Telecommuting has been linked to benefits for workers such as increased work-life balance (Duxbury et al., 2006; Hill et al., 2003; Kurland & Bailey, 1999), increased autonomy (Hill et al., 2003; Kurland & Bailey, 1999), improved productivity (Bailey & Kurland, 2002; Hill et al., 2003; Kurland & Bailey, 1999), and increased job motivation (Hill et al., 2003; Kurland & Bailey, 1999). In their study of what makes for “good teleworking,” Kossek and colleagues (2009) find that it is not formal access to teleworking that produces benefits but the flexibility of choosing when, where, and how one teleworks that positively impacts well-being.

Teleworking has also been found to have negative consequences for workers. Kurland and Bailey (1999) found that teleworking can lead to social isolation, negatively impact social networks, impede career progress, and lead to working longer hours. Teleworking has also been linked to a decrease in work-family balance if the boundaries separating work and home are not managed well (Kossek et al., 2009; Kurland & Bailey, 1999). Overall, the implications of non-traditional work arrangements for workers are contested and more research is necessary to clarify the discrepancies in research findings.

**ICT and Work Loads.** Although economic research supports a general link between the growth of an information workforce and general productivity growth beginning in the mid-1990s (Baily, 2004; Brynjolfsson & Hitt, 2000; Fernald & Ramnath, 2004; Stiroh, 2002), we know very little about how use of specific devices or applications at work influenced this productivity or whether productivity gains also fuel
more demanding work environments. There is reason to suspect that work environments are more demanding in ways that are linked to ICT use (Green, 2004a; Maume & Purcell, 2007; Rubin & Brody, 2005). For example, there is evidence that ICT use is responsible for “extending” the work day as many workers report working outside of regular business hours or working more hours as a result of ICT (Bond, Thompson, Galinsky, & Prottas, 2002; Chesley, forthcoming, 2010; Duxbury & Smart, forthcoming, 2010; Duxbury et al., 2006; Galinsky et al., 2001; Madden & Jones, 2008).

Other scholars link ICT to work intensification, either through an increase in work effort or an increase in speed in which work must be completed (Duxbury & Smart, Forthcoming, 2010; Green, 2004a, 2004b). Green’s work (2004a; 2004b) suggests that technology use is a key factor leading to the intensification of work experiences in Britain during the late 1990s. Further, research by Mano and Mensch (2010), drawing on a representative American sample, finds that both the volume of work-related email and the frequency with which work email is accessed predicts higher levels of self-reported job performance. Yet, these same features of work-related email use also contribute to higher levels of work stress and lower levels of well-being among these employees, a finding that highlights the tradeoffs that may be inherent in work-related ICT use. However, not all research supports the idea that ICT use is a central tool shaping work intensification. Bittman, Brown, and Wajcman (2009) suggest that claims that ICT supports work extension appear to be exaggerated. Overall, while a limited research base suggests a connection between ICT use and markers of work intensification, how this is happening and for whom requires further investigation.

**ICT and Work Density.** Another way that work-based ICT use may influence the nature of work concerns changes in the density of work, or the number of work activities that workers engage in at any point in time, sometimes referred to as multitasking. General ICT use appears to be linked to increased multitasking behavior both in and outside of work (Aral, Brynjolfsson, & Van Alstyne, unpublished; Baily & Konstan, 2006; Gonzalez & Mark, 2004; Mark, Gudith, & Klocke, 2008; Ophir, Nass, & Wagner, 2009; Southerton, 2007; Su & Mark, 2008). The resulting implications of ICT-facilitated multitasking and effects on workers are understudied. However, in extrapolating findings from other disciplines, there is evidence that heavy ICT-based multitasking has negative implications for users.

Existing evidence indicates that human cognition is not suited to handle multiple streams of information at once (Ophir et al., 2009). In her review of the multitasking literature, Baron (2008) found that most studies suggest that engaging in multitasking behavior decreases performance levels. Furthermore, technologically facilitated multitasking has been linked to degraded memory (Hembrook & Gay, 2003) and decreased attention spans and ability to focus in high media multitaskers in comparison to low media multitaskers (Ophir et al., 2009). Other research shows that technologically facilitated multitasking leads
to increased levels of stress (Mark et al., 2008; Su & Mark, 2008), frustration, time pressure, and effort (Mark et al., 2008). Together, these findings make a compelling argument that ICT use does have the potential to change how humans behave, think, and perceive.

However, there are drawbacks to these studies. In Ophir et al. (2009), Mark et al. (2008), and Su & Mark (2008), the study populations were small with 41, 48, and 19 participants, respectively. In addition, in both Ophir et al. (2009) and Mark et al. (2008) the study participants were college students who are more likely than older adults to be immersed in technology (Rideout, Roberts, & Foehr, 2005). It is possible that older adults in the workforce lack experience with ICT and may be more susceptible to negative implications associated with ICT use. However, investigations replicating these studies on a larger scale with a more age-representative sample of working adults would be needed. Overall, the existing evidence base suggests that ICT use is facilitating multitasking behaviors at work that may be detrimental to organizational goals and employee well-being.

**ICT Use and Work Pacing.** Researchers have found that working Americans report feeling pressed for time (Bianchi, Robinson, & Milkie, 2007; Daly, 1996; Mattingly & Sayer, 2006; Robinson & Godbey, 1997; Southerton, 2007), and there is some evidence that technological innovation is linked to feelings of increased pace or time pressure (Chesley, forthcoming, 2010; Daly, 1996; Southerton, 2007; Southerton & Tomlinson, 2005). The focus on the speed or pace with which we accomplish tasks in daily life is rooted in theoretical and empirical accounts that link ICT use to changes in the “temporal rhythms” (Southerton, 2007) of daily life. Thus, in addition to changing the volume and density of work, some scholars argue that work-related ICT use may be accelerating the pace of work.

Maume and Purcell (2007) utilized National Study of the Changing Workforce data and documented that the pace of work in the United States intensified between 1977 and 1997. The central factor responsible for this intensification was increased job complexity, which they argue may be driven by ICT use in the workplace. Furthermore, they reason that the intensification of work may be causing workers to feel that the pace of work has increased. Similar arguments, along with supporting evidence of ICT-fueled work intensification for the British workforce during the same time period have been offered by Green (2004a; 2004b).

There is also specific evidence linking ICT use to feelings of time pressure or increased pace of life. Bittman and colleagues (2009) studied whether mobile phone use affects work intensification and found that frequent use of mobile phones for men is positively associated with the sense of feeling rushed and pressed for time. Chesley (forthcoming, 2010) looked at ICT use in both work and personal settings for two distinct samples of employees and found that ICT use (computer, email, and cell phone) is positively
associated with perceptions of an accelerated pace of life. Research examining the role that ICT use may play in changing the pace of work is extremely limited, and more scholarship is needed to document the strength of the relationship between ICT use and work pacing. We also need research to determine whether particular technological platforms impact work pacing more than others, and how an increase in the pace of work affects workers’ well-being.

ICT and Home/Family

The influence of ICT on personal and family life is understudied (Meszaros, 2004; Papadakis & Collins, 2001). General research about the influence of technology use on social relationships does consider the influence of use on family relationships (Fox & Chesley, 2009; Kennedy & Wellman, 2007; Nie, 2001) as well as the influence of media use on child outcomes (see review in Brooks-Gunn & Donahue, 2008; Guernsey, 2007; Meszaros, 2004). In addition, researchers have investigated whether and how ICT use is changing family coordination (Bittman et al., 2009; Ling, 2004; Wajcman, Bittman, & Brown, 2008) and time experiences (Bittman et al., 2009; Daly, 1996; Southerton, 2007) and, thus, the nature of family relationships and family life.

ICT and Personal/Family Relationships. A long-standing question for technology researchers concerns whether an increasing reliance on technology strengthens or weakens social ties (Fischer, 1992; Ogburn & Nimkoff, 1955). These debates continue today. Most research examining the influence of Internet use on the size or make-up of social networks suggests that such use generally supports social relationships through an enhanced ability to connect and communicate with others (Boase, Horrigan, Wellman, & Rainie, 2006; Haythornthwaite, 2005; Haythornthwaite & Wellman, 2002; Wellman, 2001; Wellman & Haythornthwaite, 2002). However, some research does suggest that Internet use is tied to spending less time with friends or family (Nie, Hillygus, & Erbing, 2002). While early research on household Internet adoption and use suggested that Internet use was linked to a reduction in family communication (Kraut et al., 1998), follow-up research suggested such impacts dissipated over time (Kraut et al., 2002).

Other studies further suggest that individuals who communicate through multiple mediums such as email have stronger relationships than those who communicate only face to face (Haythornthwaite, 2005; Igarashi, Takai, & Yoshida, 2005; Kennedy & Wellman, 2007). A recent study focused on ICT use and family relationships finds that technology enables a type of family connectedness that revolves around cell phone use and shared Internet experiences (Kennedy et al., 2008). Fox and Chesley (2009) analyzed the use of email to communicate with family and found that women tend to use email more than men to keep in touch with family members (a similar pattern exists for mobile phones, see Rakow & Navarro, 1993; Wajcman et al., 2008). These national American patterns are reinforced by regional findings in a
Canadian sample (Kennedy & Wellman, 2007). Further, in the Fox and Chesley (2009) study, women who used email to maintain family relationships were more likely than male email users to report that email increased family closeness, improved family relationships, helped email users learn more about their family members, and supported frank communication with family members. However, other research indicates that ICT use may make specific types of family relationships more difficult. In particular, Mesch (2006a) finds that ICT-related conflicts between adolescents and their parents have increased in some families and these conflicts reduce family cohesion.

Overall, recent research focused on ICT use appears to support the notion that technology use is allowing us to better connect with one another and to maintain our existing relationships. However, much of this research focuses exclusively on frequency of Internet use and number of connections. Very little research looks systematically at how technology use might influence the quality, rather than the quantity, of our relationships or how technology use may influence different types of relationships in different social contexts, such as community, family, and friends (see discussion in Fox & Chesley, 2009).

Children’s ICT Use and Development. Another main concern for family scholars is whether and how technology use is impacting children’s development. In the United States, out of all family types, married couples with minor children have the highest rates of Internet and cell phone use, computer ownership, and broadband adoption (Kennedy et al., 2008). In the past decade several studies have been published specifically tracking technology trends in children. We will briefly touch on some of the key findings, but for a more thorough review of trends see Roberts and Foehr (2008), as well as a series of reports funded by the Kaiser Family Foundation (Rideout, Vandewater, & Wartella, 2003; Rideout, Foehr, & Roberts, 2010).

Overall, research documents that U.S. children have high levels of media use. In 1999, children aged 2 to 18 years were spending an average of 5½ hours a day at home using some type of media; the most commonly reported media activities were watching TV, playing video games, and surfing the web (Roberts, Foehr, Rideout, & Brodie, 1999). By 2008 the average number of hours children were exposed to media each day climbed to 7 hours and 50 minutes (Roberts & Foehr, 2008). In fact, children now spend more time using electronic media than in any other activity except sleep (Brooks-Gunn & Donahue, 2008). One important finding is how very young children are now being exposed to media at high rates. In 2003, the Kaiser Family Foundation studied children aged 6 months to 6 years and found that 68% of children under the age of 2 have average media use of 2 hours and 5 minutes (most are watching TV/DVDs, not using computers; Rideout et al., 2003). The most recent data on media use by children aged 8 to 18 indicates that older children spend more time engaged in daily media use than most of their
parents spend working-almost 11 hours per day (if you count media multitasking), 7 days a week (Rideout et al., 2010).

Research does examine connections between media use—particularly television viewing—and children’s development (Kirkorian, Wartella, & Anderson, 2008), although a focus on the impact of computer/Internet and cell phone use on development is much more limited. Previous studies connecting Internet use and learning tend to be correlational and, thus far, suggest a positive association between use and academic achievement (Kirkorian et al., 2008). Research that has focused on the use of computers and Internet technologies in the classroom shows that use of this technology presents no clear advantages over traditional forms of information delivery (Schmidt & Vandewater, 2008). There are also links between exposure to violence on television and video games and increased aggression (Escobar-Chaves & Anderson, 2008) as well as links between viewing that promotes prosocial behavior (altruism or helping behavior) and subsequent positive behaviors in children (Wilson, 2008). These findings may transfer to Internet use, particularly if such use is geared toward gaming and video exposure. Similarly, media exposure (largely through television viewing) is also associated with growing rates of obesity and alcohol and tobacco consumption in children, although the causal direction of these relationships is not well-established (Escobar-Chaves & Anderson, 2008). Findings about ICT use and children’s social relationships reinforce much of the general sociability research reviewed earlier in that children’s ICT use (e.g., email, texting, instant messaging) primarily reinforces existing social relationships. There is also some evidence that these many forms of electronic communication may be reinforcing peer communication at the expense of parental communication (Subrahmanyam & Greenfield, 2008), which could have implications for the quality of child-parent relationships. Overall, the bulk of this research examines the implications of children’s television viewing for their development, while the implications of other forms of media including Internet and cell phone use for children’s outcomes are based on quite limited research.

**ICT and Family Coordination.** Some scholars argue that ICT use—mobile phone use in particular—is behind a new “micro-coordination” of everyday life that involves a more flexible form of scheduling events (Ling, 2004; Wajcman et al., 2008). As Wajcman and colleagues (2008: 641-642) explain it, “the scheduling of events is relaxed through an ongoing sequence of reciprocal phoning ahead that enables meetings to be negotiated ‘on the fly’ so that the needs of parties can be progressively accommodated.” Indeed, there is evidence that ICT use has been a prominent factor in changing how families coordinate schedules. Wajcman and colleagues (2008) interviewed a representative sample of Australian online users and found that most view the phone as “very important” for coordinating the timing of the arrival home and meeting other family members; among parents, most view the phone as “important” for arrangements involving children. Work by Southerton (2007) reinforces this idea. Drawing on in-depth
interviews with a British sample, he finds that ICT use is associated with a fragmenting and re-sequencing of daily tasks that allow for more "individualised modes of temporal ordering." Indeed, his results suggest that ICT is used as “coordinating devices” which help to formulate or reschedule personal or family arrangements at the last minute. In many ways, ICT-based micro-coordination in family life mirrors “just in time” practices that are prevalent in organizations and supported through complex technological systems involving computers, scheduling software, and 24/7 communications.

Wajcman and colleagues (2008) have argued that one of the implications of ICT-based micro-coordination practices is an increase in an individual’s ability to maintain contact and intimacy with family members, even when one is not physically present. Ling (2007) argues that ICT-enhanced micro-coordination practices are ways of extending and reinforcing important social rituals (e.g., greetings, joke-telling) that support broader social cohesion. Thus, we might expect that micro-coordination practices used by family members support family cohesion, although there is little direct empirical evidence on this point.

**ICT Use and Family Time Experiences.** Ventura (1995) argues that a central implication of widespread ICT use is that it shapes our time experiences by fragmenting them through continual interruption, leading to a more frenetic pace of daily life, a theme that is also echoed in the work of Daly (1996). There is evidence to suggest that individuals believe their lives are becoming more harried (Mattingly & Sayer, 2006; Robinson & Godbey, 1997; Southerton, 2007), although evidence linking feelings of harriedness to ICT use is limited (Chesley, forthcoming, 2010). Time diary data collected over the past 30 years show that subjective levels of time pressure for Americans have increased markedly (Mattingly & Sayer, 2006; Robinson & Godbey, 1997). This trend has also been specifically identified in families with children (Bianchi et al., 2007; Southerton, 2007). Indeed, Bianchi and colleagues (2007) document a positive association between the prevalence of multitasking behavior and feelings of time pressure in individual family members. Although they do not test the role of ICT use in supporting this linkage, as we discuss earlier in this review, multitasking is a key behavior believed to be supported through ICT use, and ICT use is prevalent in families with children.

Very little research tests whether ICT use leads to more fragmented time experiences or greater multitasking that, in turn, cultivates feelings of time pressure. Southerton’s (2007; 2005) work suggests that both processes may be connected to feeling harried, and recent work done by Chesley (forthcoming, 2010) links more frequent ICT use to perceptions of an accelerated pace of daily life in a regional sample of American employees. However, work by Bittman and colleagues (2009) found little evidence that mobile phone use produced feelings of harried leisure. Previous research examining the consequences of a faster pace of life, while limited, finds that feelings of time pressure have implications for both physical
health and psychological well-being. For example, Levine and Norenzayan (1999) studied pace of life in 31 countries and identified links among pace of life and the physical and psychological well-being of communities, finding that faster places tended to have worse health outcomes.

**ICT and Work/Home Boundaries**

Interest in the role that technology use plays in shifting public/private boundaries is a historical mainstay of scholarship focused on the social implications of technological innovation. A physical and cultural separation between “work” and “family” that emerged in conjunction with industrial capitalism makes a discussion of boundaries between work and non-work activities/roles/time/psychological states meaningful (Daly, 1996; Mesch, 2006b). At the end of the 1990s, and coinciding with broad adoption and use of the Internet, interest in the role that ICT use might play in shifting public and private boundaries—particularly boundaries between work and personal/family life—emerged once again (Haddon & Silverstone, 2000; Lewis & Cooper, 1999). The potential implications of this technologically facilitated blurring range from greater workplace flexibility—as information jobs largely accomplished through ICT use could be performed outside the traditional office—to fears that work would “take over” other activities (Hoffman & Bulger, 2009; Lewis & Cooper, 1999). While concerns about the role of technology in shaping public and private boundaries are not new (see Wajcman et al., 2008), how this potential blurring is playing out in the current round of technological innovation is unclear.

Boundary/border theory (Ashforth, Kreiner, & Fugate, 2000; Clark, 2000; Nippert-Eng, 1996) is a central theoretical framework informing research on ICT use and boundary permeability. While summaries of this framework and its permutations exist elsewhere (see Desrochers & Sargent, 2003; Duxbury & Smart, forthcoming, 2010; Hoffman & Bulger, 2009), briefly, boundary/border theory “is a general cognitive theory of social classification that focuses on outcomes such as the meanings people assign to home and work and the ease and frequency of transitioning between roles” (Desrochers & Sargent, 2003). The general theoretical framework addresses how people “construct, maintain, negotiate, and cross” (Desrochers & Sargent, 2003) social boundaries with a large emphasis placed on the permeability of boundaries between paid work and personal life.

Evidence informing whether ICT use is supporting more permeable boundaries between social domains like work and personal life is very limited and somewhat mixed. One study drawing on a nationally representative American sample of employees finds that more fluid work/personal boundaries are produced structurally as employees use ICT outside the workplace and outside of normal scheduled work hours (Galinsky et al., 2001), although the survey item measuring this assessment potentially conflates ICT use and working outside of one’s scheduled work hours. In another study drawing on a longitudinal,
regional sample of employees, Chesley (2005) documents an association between increased mobile phone use (but not computer/email use) and more permeable work and personal boundaries. Opinion data drawn from American samples also appears to reinforce the notion that ICT use and more permeable work-home boundaries go together. Data from a nationally representative sample of workers analyzed by the PEW Internet and American Life project finds that “networked” workers (i.e., those that use email and the Internet at work) report doing “some” at-home work more frequently than other workers (Madden & Jones, 2008). However, Wajcman and colleagues (2008), drawing on a sample that is representative of the online population in Australia, tested links between mobile phone use and the incidence of work-personal spillover (used as a measure of boundary permeability) and found no evidence of a significant linkage. They conclude that phone use is not facilitating more permeable work-home boundaries, and, in a follow-up piece, they argue that claims that ICT use is facilitating the spillover of work into home life are exaggerated (Bittman et al., 2009). It is worth noting that their online sample differs in one key respect from a nationally representative Australian sample—the online sample used in their study is younger than a general population sample would be. Chesley (2005) argues that the link between ICT use and boundary permeability should be weaker—or may even disappear—among younger workers. Overall, a limited evidence base appears to support the idea that ICT use and boundary permeability are positively associated; however, this association has not been verified through extensive testing in global samples.

If ICT use supports blurring boundaries across social domains, what are the social consequences of this phenomenon? This is another question that has not been extensively analyzed, particularly when it comes to work-personal blurring. Chesley (2005) found that more permeable boundaries between work and home, facilitated by ICT use, were associated with increases in distress and decreases in family satisfaction. PEW data on “networked” workers collected in 2008 indicates that while these workers are more likely to report that ICT use helps them do their jobs more effectively, they also believe use increases the demand for more work hours, increases stress levels, and makes it more difficult to “disconnect” from work (Madden & Jones, 2008). The association between ICT use and the perception on the part of workers that ICT is linked to greater workplace effectiveness and greater workloads has been documented in other samples, as well (Chesley, forthcoming, 2010).

Overall, a positive association between ICT use and boundary permeability has not been firmly established across different samples and use contexts. Further, research connecting technologically facilitated boundary permeability to economic, social, and health outcomes is also quite limited. While it is clear that, to some extent, work-personal boundaries are socially constructed (Hoffman & Bulger, 2009; Nippert-Eng, 1996), the flexibility of users to manipulate technology to construct these boundaries as they wish may be more limited than we think. For example, Hoffman and Bulger (2009) point out that general
social norms may lean toward using ICT to support greater access (see also Turkle, 2008), rather than limiting or controlling access (although see arguments in Wajcman et al., 2008). In addition, employers may use technology to filter information or monitor activity in ways that shape employees’ use at work and outside work, with implications for work-personal boundaries.

Implications for Research and Practice

This review demonstrates that there is a growing evidence base linking ICT use to changes in workplace practices, family life, and public/private boundaries that have implications for both organizational and family outcomes and research, as well as the policies and practices recommended and utilized by work and family practitioners. Overall, a few key conclusions emerge. First, while this review has focused generally on “ICT use,” an overarching pattern in many of the findings we have described is that the social consequences of use often depend on: (1) the use of a specific device or application (i.e., the Internet vs. the mobile phone) and (2) the context of use (i.e., work-related or personal use; see Chesley, forthcoming, 2010). Thus, a lack of studies that track use of a range of different devices or applications in particular contexts and link these different forms of use to specific outcomes is probably one important reason for mixed findings in a number of areas.

Another reason for mixed empirical findings may be connected to a lack of cross-country comparative studies of ICT use, work, and family life. Although obtaining the data for such comparisons is admittedly difficult, we are struck by different findings about the social implications of ICT use that appear linked to very different cultural contexts. Thus, we have a handful of studies drawn from American and British samples (Chesley, forthcoming, 2010; Southerton, 2007) that appear to support a positive association between ICT use and time pressure while data from an Australian sample (Bittman et al., 2009) do not. Yet, how ICT use translates into feelings of time pressure is likely mediated by the surrounding culture (Levine & Norenzayan, 1999). The implication is that technologically mediated communications and actions may not have the same meaning across cultures; thus, we should not expect the social consequences of this use to be consistently observed in different cultural contexts. Untangling the role of particular cultural contexts in shaping the social implications of ICT use is a task for future research.

Third, the emphasis in technology studies, particularly in the American context, appears to be on examining the implications of technological innovation for employment experiences, with fewer studies and scholars exploring the implications for family life, despite repeated calls to do so (Chesley, 2006; Mesch, 2006a; Watt & White, 1999). Thus, the opportunities for family researchers are there to make a valuable contribution to our knowledge base. Indeed, even in the area of technological innovation and paid work, there are important opportunities to expand our knowledge about the consequences of ICT
use for changes in the nature of paid work in modern economies, particularly in the areas of ICT use and work load, pacing, and multitasking.

The research findings summarized here should be of interest to practitioners who work with employees or families. In terms of employment, we hope this review makes clear that ICT use has both advantages and disadvantages in the workplace—the trick is to form policies and practices that encourage use that produces benefits while discouraging forms of use that detract from employee performance. For example, while there is some evidence that ICT investments are linked to productivity increases at the macro-level, whether ICT use is enhancing the productivity of individual employees is an open question (Duxbury, Lyons, & Higgins, 2008), although employees appear to perceive that use enhances their effectiveness at work (Chesley, forthcoming, 2010; Madden & Jones, 2008; Mano & Mesch, 2010). Yet, there is a limited but growing body of evidence that links technology use to particular workplace behaviors—like multitasking—that appears to detract from productivity and to increase employee stress. In addition, the weight of the (again very limited) evidence also suggests that ICT use among employees is extending work into personal life. Although few studies assess the implications of this work extension, particularly in the American context, those that do tend to find that this is connected to negative employee outcomes. These factors should be considered when forming or enforcing policies around ICT use in the workplace.

The reviewed findings also have implications for family therapists and other family practitioners. Thus far, there is very little evidence suggesting that ICT use is linked to weakened family cohesion, although there may be specific cases (e.g., parent-child relationships) where more caution on this point is warranted. Instead, most findings point to the fact that individuals use ICT to maintain intimacy in their most important family relationships. Family practitioners should be aware of the influence of ICT use on changing family dynamics, particularly the emergence of “micro-coordination” practices in family life. Although hard evidence on the implications of this type of family coordination is not well-established, scholars speculate that micro-coordination serves to strengthen family relationships, although it may also change family time experiences in ways that detract from family life.

While the current wave of technological innovation is part of a much longer historical trend, we believe this review shows that current technological practices do have relevance for work-life studies and that much more needs to be learned about the implications of ICT use in a variety of social contexts. We urge scholars to continue to develop knowledge about how these technologies are being used and to investigate the implications of this use. Practitioners also need to attend to the role that ICT use is playing in employment and family experiences as they create organizational policies and advise employees and families.
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Locations in the Matrix of Information Domains of the Work-Family Area of Studies

The Editorial Board of the Teaching Resources section of the Sloan Work and Family Research Network has prepared a Matrix as a way to locate important work-family topics in the broad area of work-family studies. (More about the Matrix ...).

Note: The domain areas most closely related to the entry's topic are presented in full color. Other domains, represented in gray, are provided for context.

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Domain F: Theoretical Underpinnings to All Domains
About the Matrix

Sloan Work and Family Research Network
Resources for Teaching: Mapping the Work-Family Area of Studies

Introduction

It was appropriate that the members of the Founding Editorial Board of the Resources for Teaching began their work in 2000, for their project represented one of the turning points in the area of work and family studies. This group accepted the challenge of developing resources that could support the efforts of teaching faculty from different disciplines and professional schools to better integrate the work-family body of knowledge into their curricula. The Virtual Think Tank began its work with a vision, a spirit of determination, and sense of civic responsibility to the community of work-family scholars.

A fundamental challenge emerged early in the process. It became clear that before we could design resources that would support the teaching of those topics, we would first need to inventory topics and issues relevant to the work-family area of studies (and begin to distinguish the work-family aspect of these topics from "non work-family" aspects).

The members of the Virtual Think Tank were well aware that surveying the area of work and family studies would be a daunting undertaking. However, we really had no other choice. And so, we began to grapple with the mapping process.

Purpose

1. To develop a preliminary map of the body of knowledge relevant to the work-family area of study that reflects current, "across-the-disciplines" understanding of work-family phenomena.

2. To create a flexible framework (or map) that clarifies the conceptual relationships among the different information domains that comprise the work-family knowledge base.

It is important to understand that this mapping exercise was undertaken as a way to identify and organize the wide range of work-family topics. This project was not intended as a meta-analysis for determining the empirical relationships between specific variables. Therefore, our map of the workfamily
area of study does not include any symbols that might suggest the relationships between specific factors or clusters of factors.

**Process**

The Virtual Think Tank used a 3-step process to create the map of the work-family area of studies.

1. **Key Informants:** The members of the Virtual Think Tank included academics from several different disciplines and professions who have taught and written about work-family studies for years. During the first stage of the mapping process, the Virtual Think Tank functioned as a panel of key informants. Initially, the Panel engaged in a few brainstorming sessions to identify work-family topics that could be addressed in academic courses. The inductive brainstorming sessions initially resulted in the identification of nearly 50 topics.

Once the preliminary list of topics had been generated, members of the Virtual Think Tank pursued a deductive approach to the identification of work-family issues. Over the course of several conversations, the Virtual Think Tank created a conceptual map that focused on information domains (see Table 1 below).

The last stage of the mapping process undertaken by the Virtual Think Tank consisted of comparing and adjusting the results of the inductive and deductive processes. The preliminary, reconciled list was used as the first index for the Online Work and Family Encyclopedia.

2. **Literature review:** Members of the project team conducted literature searches to identify writings in which authors attempted to map the work-family area of study or specific domains of this area. The highlights of the literature review will be posted on February 1, 2002 when the First Edition of the Work-Family Encyclopedia will be published.

3. **Peer review:** On October 1, 2001, the Preliminary Mapping of the work-family area of study was posted on the website of the Sloan Work and Family Research Network. The members of the Virtual Think Tank invite work-family leaders to submit suggestions and comments about the Mapping and the List of Work-Family Topics. The Virtual Think Tank will consider the suggestions and, as indicated, will make adjustments in both of these products. Please send your comments to Marcie Pitt-Catsoughes at pittcats@bc.edu
Assumptions

Prior to identifying the different information domains relevant to the work-family area of study, members of the Virtual Think Tank adopted two premises:

1. Our use of the word “family” refers to both traditional and nontraditional families. Therefore, we consider the term “work-family” to be relevant to individuals who might reside by themselves. Many work-family leaders have noted the problematic dimensions of the term “work-family” (see Barnett, 1999). In particular, concern has been expressed that the word “family” continues to connote the married couple family with dependent children, despite the widespread recognition that family structures and relationships continue to be very diverse and often change over time. As a group, we understand the word “family” to refer to relationships characterized by deep caring and commitment that exist over time. We do not limit family relationships to those established by marriage, birth, blood, or shared residency.

2. It is important to examine and measure work-family issues and experiences at many different levels, including: individual, dyadic (e.g., couple relationships, parent-child relationships, caregiver/caretaker relationships), family and other small groups, organizational, community, and societal. Much of the work-family discourse glosses over the fact that the work-family experiences of one person or stakeholder group may, in fact, be different from (and potentially in conflict with) those of another.

Outcomes

We will publish a Working Paper, "Mapping the Work-Family Area of Study," on the Sloan Work and Family Research Network in 2002. In this publication, we will acknowledge the comments and suggestions for improvement sent to us.

Limitations

It is important to understand that the members of the Virtual Think Tank viewed their efforts to map the work-family area of study as a "work in progress." We anticipate that we will periodically review and revise the map as this area of study evolves.

The members of the panel are also cognizant that other scholars may have different conceptualizations of the work-family area of study. We welcome your comments and look forward to public dialogue about this important topic.
Listing of the Information Domains Included in the Map

The members of the Virtual Think Tank wanted to focus their map of work-family issues around the experiences of five principal stakeholder groups:

1. individuals,
2. families,
3. workplaces,
4. communities, and
5. society-at-large.

Each of these stakeholder groups is represented by a row in the Table 1, Information Domain Matrix (below).

Work-Family Experiences: The discussions of the members of the Virtual Think Tank began with an identification of some of the salient needs & priorities/problems & concerns of the five principal stakeholder groups. These domains are represented by the cells in Column B of the Information Domain Matrix.

- Individuals' work-family needs & priorities
- Individuals' work-family problems & concerns
- Families' work-family need & priorities
- Families' work-family problems & concerns
- Needs & priorities of workplaces related to work-family issues
- Workplace problems & concerns related to work-family issues
- Needs & priorities of communities related to work-family issues
- Communities' problems & concerns related to work-family issues
- Needs and priorities of society related to work-family issues
- Societal problems & concerns related to work-family issues

Antecedents: Next, the Virtual Think Tank identified the primary roots causes and factors that might have either precipitated or affected the work-family experiences of the principal stakeholder groups. These domains are highlighted in Column A of the Information Domain Matrix.

- Individual Antecedents
- Family Antecedents
• Workplace Antecedents
• Community Antecedents
• Societal Antecedents

Covariates: The third set of information domains include factors that moderate the relationships between the antecedents and the work-family experiences of different stakeholder groups (see Column C in Table 1).

• Individual Covariates
• Family Covariates
• Workplace Covariates
• Community Covariates
• Societal Covariates

Decisions and Responses: The responses of the stakeholder groups to different work-family experiences are highlighted in Column D.

• Individual Decision and Responses
• Family Decisions and Responses
• Workplace Decisions and Responses
• Community Decisions and Responses
• Public Sector Decisions and Responses

Outcomes & Impacts: The fifth set of information domains refer to the outcomes and impacts of different work-family issues and experiences on the principal stakeholder groups (see Column E).

• Outcomes & Impacts on Individuals
• Outcomes & Impacts on Families
• Outcomes & Impacts on Workplaces
• Outcomes & Impacts on Communities
• Outcomes & Impacts on Society

Theoretical Foundations: The Virtual Think Tank established a sixth information domain to designate the multi-disciplinary theoretical underpinnings to the work-family area of study (noted as Information Domain F).
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