

Boundaries between work and leisure within psychosocial life environment – an interdisciplinary literature review

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Today, being physically away from the workplace does not mean that we necessarily are changing to another environment or leaving our work tasks behind in psychological terms. This paper presents a review of the literature that identifies the effects that cause a blurring of the line between work and leisure. It combines theories from the fields of Informatics, Psychology and Work Science. The results show that people express the need for a balance between work and leisure but are less able to find or create ways of allowing the necessary time for recovery. Presented are some initial suggestions on how to design ICT in order to separate work and leisure activities.

Introduction

The presence of ICT (Information Communication Technology) in the psychosocial work environment has increased rapidly during the past 30 years and this development has provided workers and organizations with the ability to work while away from the office and on the move. This way of working is often characterized in terms of access to information and the possibility of being independent of time and place: that is, anytime, anywhere (Perry et al, 2001).

The requirement of being at a specific place for a specific length of time has changed. Before television became a common leisure activity in our homes, people had more structure related to the everyday use of ICT in society. For example, at the beginning of the television revolution programs started a specific time and ended at a specific time on a limited number of channels. By contrast, today we can watch television whenever we want regardless of where we are as long as we have an Internet connection through our mobile phones or computers.

When we entered the industrial age, the primary workplace was outside the home, perhaps in a factory or office building. After the workday, the workers would return home or go to another place where they spent their leisure time. Work time and work place were dictated by the employer. With this separation, that is, performing a specific activity at a specific place, the physical and psychological boundaries between home and workplace became easier to define. People went to their place of employment to work and came home to do necessary household tasks and spend their leisure time (Dahlbom, 2003; Jarrick, 2005).

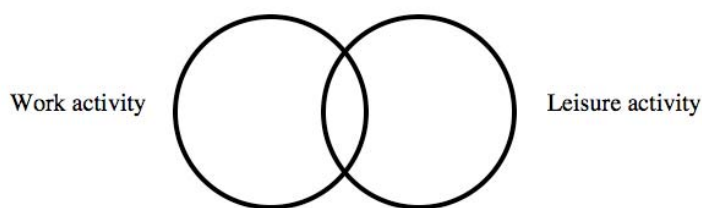


Figure 1. Past: work and leisure activities overlapped to a more limited degree. People were largely able to separate their work time from their leisure time.

Today, being physically away from the workplace doesn't mean that we are necessarily changing to another environment or leaving our work tasks behind in psychological terms. The focus is on completing the work on time, so it does not matter where (place) or during what time (24/7) the work is done. Today we can use ICT whenever we wish and some of us may even feel bound to stay connected, not just with our fellow employees but with friends and family as well.

Work and leisure are defined by most as completely different activities, but they are in reality bound together and work could not exist without leisure and vice versa. But, even if leisure provides humans time for recovery, work more frequently appears to squeeze out leisure. Work might be seen as an alienation activity often referred to as "responsibility", while leisure is defined as a time of freedom where the activity is chosen by the individual as a means of self-expression and creativity. Regarding the possibilities of being able to work any time and from any place, the challenge is that as one achieves more freedom one has to plan work time thereby making it harder to plan leisure time (Allvin et al, 1998). The young people of today have more evening and nightly activities than in the past (e.g., increased availability of television programs and channels, Internet, mobile phone). Moreover, the young people of today not only sleep less compared to young people 100 years ago, but they are doing it by choice. One might ask how addicted have we become to our mobile phones and computers?

Above, we see some of the numerous benefits from the use of ICT: being able to reach someone regardless of place and time and the ability to search for information about everything. There are, however, numerous outcomes that we have come to experience as being psychologically or even physically negative for humans, not least when we are unable to create a boundary between work and leisure. With this paper we focus on some of those effects that can be found in a review of the literature.

Thus, the aim of this paper is to present a summary of effects that cause the blurring of boundaries between work and leisure in order to offer some suggestions on how to continue research within this field. The paper is set up as follows: initially we present studies concerning psychosocial life environment and life roles in interaction with daily use of ICT. In order to discuss different environments and roles, we present common background theories of how a person fulfils a number of roles and how these together constitute one's life role. In addition to this, we present results concerning the relationship between ICT and psychosocial health. Finally, we connect identified effects to implications for design in order to further explore the context of life role and life environment in relation to an individual's use of ICT.

Psychosocial life environment

Since the end of the 1970s, numerous of researchers have focused on how work roles and psychosocial work environmental factors are changing in interaction with ICT e.g. life role and life environment (Bradley, 1986); how stress is a part of life (Frankenhaeuser and Ödman, 1983); new conditions for work life (Hanson, 2004); the individual in work life (Lennerlöf, 1991; Levi, 2001; Osborne, 1985). According to Bradley, psychosocial work environment is defined as follows:

“The term psychosocial work environment is used to signify the course of events or the process that occurs when objective factors in the environment are reflected in the individual’s perception (either positive or negative) of work and condition of work. Its essence is the interaction between the environment and the individual. Thus work environment factors exist at different levels – the level of society; the level of the company and level of the individual – and they interact with one another. But there is also a distinction between the objective and the subjective work environment, which also interact.” (Bradley, 2001, pp 36.)

The work environment, as described above in the quotation, can be approached from different levels and from different perspectives. Concerning the human that moves between these different environments, one is not only shaped and controlled by his/her physical human characteristics but can also shape his/her life through personal choice and action. Based on this view, Bradley (1986, 2001) illustrates the dual relationship between objective and subjective work environment. In figure 2 the constant interaction between objective and subjective work environment is shown.

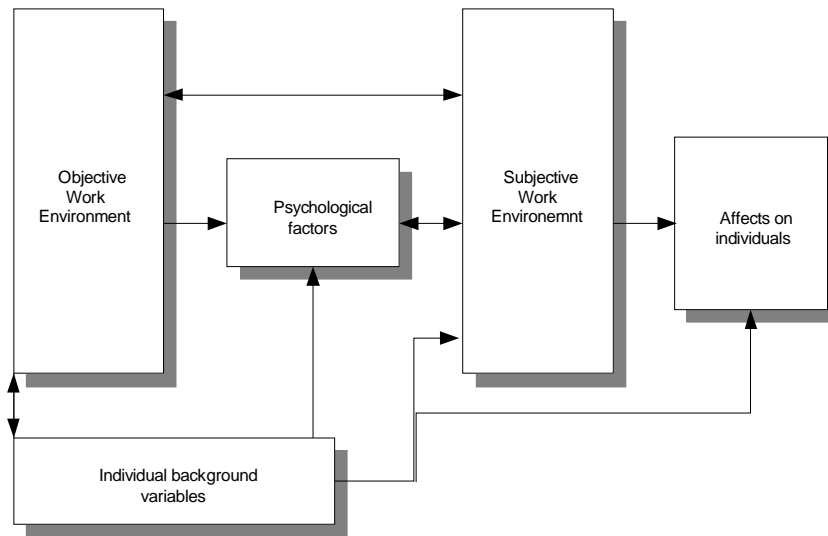


Figure 2. Relationship between ICT, objective and subjective work environment and stress. Adapted from Bradley, 1986, 2001.

With the daily use of ICT, our tempo of living is increasing and we are developing new opportunities for flexibility in work and learning independent of location and time. In her latest book, Bradley (2006) brings forward some examples in various areas of life that are being challenged in the ICT society. She also discusses how to get closer and involve the individual in the ICT society by performing and combining research concerning physical and psychosocial life environment, human need, human requirements and human rights.

Home and work environments

Today, one can carry out different activities in many different environments (home, office, public) but one must “carry out” a *role* to be able to be a part of an environment. These roles are more or less predefined and put the individual in the position of either adjusting to the role or giving up any attempt to enter the profession. According to Goffman (1974) *environment* is describes as a stage. We daily use different stages where we perform roles in order to interact with other people in different situations. A person’s life role can be divided into three major sub-roles: the professional role (work life), the private role (private life) and the citizen’s role (public life) (Bradley 2001, 2006). Every person embodies different roles (mother, researcher, neighbour), and these together constitute a *life role* (see Figure 3).

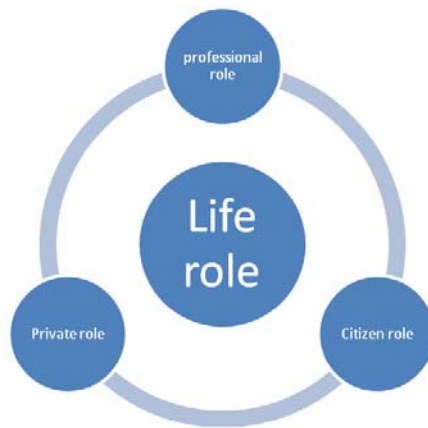


Figure 3. A person's life role can be divided into three major sub-roles: the professional role (work life), the private role (private life) and the citizen's role (public life)

In this paper, the concept *life role* covers the combined *professional role*, *private role* and *citizen role*. The *private role* includes activities that refer to one's private life (the home as both a work environment and a private environment). The *professional role* includes activities that refer to one's work life (the content of one's job and different aspects of the psychosocial work environment, physical and virtual places for performing work, etc.). The *citizen role* includes activities that refer to life as a citizen within the larger society (to what extent citizens of today take an active interest in societal issues, e.g., political issues and are active within voluntary, non-profit organizations, etc.).

The "home environment" is the structure in which we live because it is our base in life even though we perform activities within other environments during most of our waking hours. Through different ICT's such as the mobile phone, a person becomes mobile and the home can thereby regain its historic function as a work place as it was in an agrarian society. In this way, we can bring the working solidarity we had during the agrarian society back to our homes (Dahlbom, 2003). In today's society, ICT helps us become nomads, and the home—together with other meeting places—becomes our workplace (Bradley, 2006).

The "work environment" could be an office, a factory or the school. One major study of office design in relation to psychosocial health presents results concerning workers who did not have a permanent workplace and reveals how their offices were a psychosocial work environment. Some of us feel safe at our work desk and/or in front of the computer because it has become our second home (Danielsson, 2005).

School environment, another example of a work environment, was earlier seen as an institution with power and status, but today it has lost this aura. As a result, students and teachers can more readily be subject to criticism by the public because the school has become more human and open to public view (Zeihe, 1986). The school of today is no longer simply a special building, it is also a homepage on the Internet as more and more education is available online through

IT-high schools and IT-universities. Many students today can in some way relate more to an activity on the Internet than to a school building (Dahlbom, 2003).

Research concerning the school system has primarily focused on providing a historical perspective of teachers' health, work, and professional roles (e.g. Carlsson et al, 2004). Although it is relatively easy to find research about students' health (Laurell, 2005; Smedje, 2000), research about how they combine school time and leisure time is limited. By the end of the 1990s, several researchers focused on how a complete education could be achieved with the help of computers in schools, e.g., students' use of the Internet (Bergman, 1999) computers in learning environments (Danielsson, 1999; Edström and Riis, 1997; Jedeskog, 1994; Pedersen, 1998; Riis and Jedeskog, 1997).

Nevertheless, the conditions in a work environment can to a great extent be compared to and reflect the conditions in a school environment. Some of the common factors are an increased usage of ICT, greater personal responsibility, self-directed work and a change of the psychosocial work environment (to both the individual and the organization).

Use of the Mobile Phone

Our use of ICT has become an everyday experience. Among other devices, mobile phones provide a medium through which young people can maintain their social network (Taylor and Harper, 2003). By analyzing the various ways young people use their mobile phones, we can understand their lifestyles and their relation to ICT (Licoppe and Heurtin, 2001). Ito (forthcoming) argues that mobile use among Japanese teenagers is structured by the power-geometrics of place, and their usage is highly deferential to the context (home, school, public) in which they find themselves. Mobile communication allows them to create a private place of communication. The evidence suggests that young people are more or less addicted to their mobile phones that play a major role in their daily lives. Kato (2006) has observed that the mobile phone (keitai¹) has become a seemingly indispensable medium for Japanese youth.

Our extensive use of mobile phones is just one example of how ICT has become an important part of our daily life. In 2002 the number of mobile phone subscribers overtook the numbers of fixed-line telephone subscribers on a global scale (Srivastava, 2005). Through the mobile phone we become available for communication 24/7, that is, 24 hours a day, 7 days a week. While some might find this intrusive, young people often consider it to be more future-oriented and feel themselves to be more open to accepting new ways of using ICT in everyday life compared to adults; it is experienced as a lifestyle (Dahlbom, 2003). Young people do not regard the mobile phone as simply a work tool, they see it as an accessory to show off to their friends and as something that can help them to

¹ Mobile phones are in Japanese called keitai denwa (portable phones). Most often known simply as keitai.

achieve status (Dahlbom, 2003). Many children of today are growing up with the readiness to accept a range of new technologies, in other words, “born to be wired”. Today’s youth are often assumed to spend more time online than using any of the other media (radio, television, print, etc.).

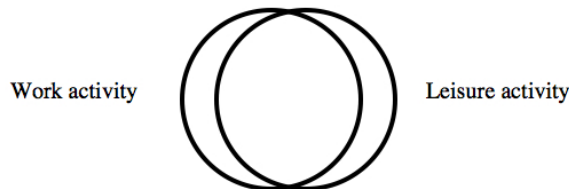


Figure 4. Today: with present ICT, work and leisure activities can easily overlap.

It is important to notice that as technology develops, various teaching methods are tried out (e.g. in schools), but they are seldom evaluated until it is time for the next method to be tested (Danielsson, 1999).

There already exists diversity among learners in today’s school, and this diversity in learning might be supported by the use of different e-learning—that is, electronic learning—technologies (Minton et al, 2004). There will always be individual differences between us and, therefore, we must avoid to consider ICT as an object in itself and instead look at how we use ICT. That is in line with what Croon Fors (2006) discusses in her thesis: in order to envision the reflexive nature of information technology, the relationship between human experience and information technology must be comprehended as a whole (ibid).

Affects on individuals

At the beginning of 2000, several studies were conducted on the positive and negative effects of ICT on health and behaviour patterns (see e.g. Allvin et al. 1999; Bradley, 2001; Hansson, 2004; Lennerlöf et al, 1991; Sandberg and Augustsson, 2002; Åborg, 2002). Studies have indicated that the boundaries between private and working life could diminish for IT professionals working from home (Ahrentzen, 1990; Ziljstra & Sonnentag, 2006). Ziljstra & Sonnentag (2006) argue that this can even affect the ability to recover from the stress of work, that boundaries between work and home have an important psychological function that help people to create a essential psychological distance between work and themselves.

According to Söderström et al. (2003) and Senge (1990), we need balance in our lives to be healthy. This can be both the balance between being active and passive and between being awake and sleeping. Stress can occur, if there is an imbalance in these circumstances. According to Dahlgren (2005), it is important to achieve a balance between stress and recovery to be able of manage stressful situations. Her studies show that both overtime work and high work-related stress affect the possibilities for recovering.

Young urban knowledge workers

Danielsson (2007b) presented in her thesis a research process combining theories from the fields of Informatics, Psychology, Work Science and Gender Theory. She focused on concepts such as roles, environment, boundary, work, leisure, health and barriers as well as conducting interviews with IT-professionals, defined as young urban knowledge workers (Danielsson, 2002, 2003) and high school IT-students who are likely to become future professionals in the business (Danielsson, 2007a). Her two studies were based on 20 semi-structured interviews that included ten adults and ten teenagers.

The ten people included within the focus group of young urban knowledge workers were people who worked in some kind of IT firm as an employee and/or as an owner. They were single or cohabiting and had an educational background within an IT-related academic field. Some had finished their degree and some had not. The number of men and women were equal within this group. Moreover, they were expected to be interested in reflecting and expressing themselves within the framework of the presented problem of the study.

The young urban knowledge workers experienced themselves as having a strong social network in which their workmates and friends often turned out to be the same. Both their interest in their work, which allowed them to let working time dominate over leisure time, and their socialization with friends who also were their colleagues, created the experience common among them that it was difficult to separate work from leisure. They were constantly accessible, by mobile phone or e-mail, in order to discuss work with their colleagues or clients. At the same time, they were positive about being able to choose the time and place for their work. The only time they experienced a difficulty with planning free time was for vacation because they would not know the workload at the time.

Working more than 40 hours per week was not considered a problem; rather they experienced it as flexibility in being able to work irrespective of time and place. Consequently, the demand was that they must be reachable via mobile phone and/or e-mail. Through the mobile phone they were always connected to work whether their workplace was at home or some other place. However, these flexible working conditions placed more demands on the individual who was required to define his/her own working conditions and make the distinction

between work time and free time (*freedom under responsibility*). This was a distinction these young urban knowledge workers unfortunately found hard to define. These results agree with the findings of Ahrentzen (1990), Zijlstra & Sonnentag (2006) and Danielsson (2002). According to Söderström et al. (2003), we need balance in our lives to be healthy.

In addition to this, Nyberg (2008) has explored people's attitudes to digital artifacts and has identified some strategies people use in order to either *separate* the professional role from the private role or in order to *unite* the two. One of the groups she observed resembled the young urban knowledge workers, that is, IT-professionals. Both used the computer and mobile phone to a great extent in their own work. However, her respondents performed research concerning digital artifacts and its consequences in different contexts in contrast to the young urban knowledge workers who developed digital artifacts or worked with ICT services. Moreover, her respondents' work situation was also a form of *freedom under responsibility* in that they could work either from home or at the work place. The professionals Nyberg observed changed their behavior towards ICT, and choose either to separate or unite the two contexts, or both at different times. At different times in life, they felt a need to either create a clear distinction between the professional role/work context and the private role/home, or intertwine the two. One respondent, considered to be an "early adopter" felt "fragmented" and "fed up" with having a day that was too ambivalent. Therefore, he reached the point where he created clear lines between the contexts of work and home, being professional and private, and currently expressed himself as being more careful in his use of ICT (Nyberg, 2008). Nyberg has posited three categories: (1) private users that have an intense relation to ICT, (2) IT-professionals, and (3) non-users of ICT (people that choose not to use ICT), and what is especially interesting in her research in relation to Danielsson (2007b) is peoples' need for strategies to either merge or separate different contexts of ICT use.

High school IT-students

The 10 people included within this focus group observed by Danielsson (2007b) were students at an IT- high school. By virtue of personal interest they were attending a school with IT emphasis in all the major subjects. They did not have any children (same as the young workers that were co-habiting). The numbers of men and women were equal. Moreover, they were expected to be interested in reflecting and expressing themselves within the framework for the presented problem of the study.

The students aim was to perform all schoolwork during school hours in order to avoid homework. If they were ill, they choose to do school work at home in order to keep up with the rest of the class. It appeared they felt a great need to know that schoolwork was completed after school hours so that they could take

part in leisure activities. The students preferred to work with their friends, indicating that they were both socializing and working together, mixing their private and professional roles (Danielsson, 2007a).

Free time and leisure activities appeared to be of great importance; they expressed a need to do things *they* chose to do (*freedom*). However, they had chosen their major subjects because of an interest in the field and, for that reason, they often performed activities outside school that later could be used as school assignments. In short, they failed to notice that schoolwork and leisure interests were virtually one and the same. Moreover, their workplace could be identified as both the school and their computer desk at home (ibid).

Whereas the young urban knowledge workers allowed work time to dominate leisure time, the students did the opposite. For example, their teachers allowed them to read private e-mail for a few minutes before the lecture began and, thereafter during the remainder of the lecture, just read e-mails referring to school work (*responsibility*). Significantly, they never turned off their mobile phones even though they were supposed to do that during class. It felt too stressful for them to turn the phone off out of concern that they would miss an important call or SMS (ibid), a result similar to the students observed by Itu (forthcoming) who also used their mobile phones during lectures. The phone was not used to receive calls, but in order to send e-mails to friends both present in the classroom and elsewhere.

The students in Danielson's (2007a; 2007b) studies experienced both positive and negative stress as well as physical problems that they blamed on the ergonomically deficient work environment. In today's school, work and free time are most often clearly separated by time and place. However, the previous clear demarcation between schoolwork and free time is becoming blurred leading students to risk ending up in similar psychosocial environments as the young urban knowledge workers.

Sleep, recovery and psychosocial health

The size of the workload is negatively related to psychological detachment from work during evening hours, and that psychological detachment from work is associated with positive mood and low fatigue (Sonnentag & Bayer, 2005). There have been major investigations showing results concerning young people that reveal how they experience stress and their psychological health (SOU 2006:77). As has long been known, adequate sleep has a strong relationship to good health. Those people who sleep too little become tired and have a hard time focusing. This naturally affects the ability to perform their jobs effectively. Numerous studies show that too little sleep for youths increases the risk of psychological problems (e.g., Vignau et al., 1997; LeBourgeois et al., 2005). Sleep is an important factor for our ability to recover and deal with the demands and stimuli

of the working day. The length of the working day as well as the characteristics of the work could affect the possibility of unwinding and recovering after a day of work as suggested by Zijlstra and Sonnentag (2006). Recent research studies show that moderate perceived stress/worry at bedtime is related to decreased sleep efficiency (Åkerstedt, Kecklund, Axelsson, 2007) as well as the function of free-time in leading to recovery and a sense of well-being (Tucker, Dahlgren, Åkerstedt, Waterhouse, 2007).

Discussion

In the section below, we summarize the effects identified that make it difficult to create a clear separation between work and leisure thereby impacting the possibility of unwinding and recovering. The effects are identified from a review of the literature. Thereafter, we present some initial suggestions on how to continue with this field of research.

A person's life environment, which is a combination of different environments (subjective and objective work environment and home environment), life role (professional, private and citizen role) and social networks, influence the person's psychosocial health. It is important to notice that recently presented research studies show that moderate perceived stress/worry at bedtime is related to decreased sleep efficiency (Åkerstedt, Kecklund, Axelsson, 2007) as well as the function of free-time in leading to recovery and a sense of well-being (Tucker, Dahlgren, Åkerstedt, Waterhouse, 2007). Several attempts are made to make education more entertaining and interesting in order to make learning more attractive (cf. Danielsson and Wiberg, 2006, Fisch 2005, Mc Farlane, 2005). In work environments (e.g., school, university, office, home-office), learning and human resource development is essential. When people's experience of work and leisure becomes blurred, it could impact their psychosocial health. Therefore, one aspect to consider is whether we could use technology in a more individualized way (Minton et al, 2004) in order to be able to set our own boundaries when necessary.

Danielsson, (2007b), identified some similarities between "young urban knowledge workers" and the "high school students":

- The blurring of the boundary between work/school time and free time;
- The enjoyment of work/ school work based on ICT;
- Accessibility via mobile phone independent of time and location;
- Their goal in life is to "feel good" (both physically and psychologically);
- They have strong social networks (friends/colleagues are very important);

- None of them felt involved in social issues (e.g., politics);
- They experience both positive and negative stress.

Above listed similarities strengthen the impression that the effects mentioned in this paper have an impact on our psychosocial health. The subjects presented in Danielson's (2007b) research did not have any significant control over their use of the technology. The modest amount of control they had was that they were sure about how the different technologies could be used for different tasks. They expressed the feeling that they felt out-of-control when the mobile phone was turned off. Their answers revealed that being out of reach (by ICT) resulted in a feeling of lack of control; for the IT-professionals, it was lack of control concerning their work relationships (friends and colleagues were almost the same people) while for the IT-students, it was a feeling of being out of control concerning their friends and family. To help maintain a sense of control, these individuals kept their mobile phones on continually wherever they were (Danielsson, 2002, 2003, 2007a, 2007b).

The workplace can be defined as a second home where you can socialize, sleep, eat and enjoy leisure activities (Danielsson, 2002, 2003). These results are in line with the results from Christina Danielson's studies (2005) showing that when we feel safe behind our work desk (or in front of our computer), it has in effect become our second home. The results of Danielsson's (2007b) studies show that the young people and students interviewed expressed a need for balance but were less able to find or create ways of allowing the necessary time for recovery. Several of the interviewees experienced worries about their work and some had problems sleeping (ibid). Today, as the use of ICT increases, there is a risk that the experiences identified in the presented studies may emerge among a greater number of people.

The accessibility of communication anytime anywhere is to a great extent also seen in work life where talk is central to mobile work and where the telephone is the key support in ICT (Perry et al, 2001). This accessibility is mostly seen as a positive development, but it could also be a factor in increased stress. Apart from sleep, leisure time and the activities we engage in during our leisure time can also be important sources of recovery. A common definition of leisure is having time to do what we want to do and thereby achieving a sense of recovery (Bull, Hoose, Weed, 2003).

It appears that people who work professionally in the field of ICT, or use ICT in their work, experience a blurring between their professional role and private role and need to develop strategies by themselves or together with friends and family in order to separate themselves from work. We do not take the position that there should be less use of ICT, but rather there is a need to support the user in drawing a clear line between work and leisure activities, particularly when considering the students' life role and life environment, because these are the

people who will in a few years leave school and enter “work life.” If we want them to stay healthy and be prepared to manage both work and leisure, it is important to provide an opportunity for them to do so. By analyzing the various ways young people use their mobile phones, we can understand their lifestyle and relation to ICT (Licoppe and Heurtin, 2001). In order to try and predict what the future holds, we could study the development of mobile telephone use (keitai) among youth in Japan. Katu (2006) asked Japanese university students to produce dramatic visual or radio stories on the theme of keitai communication. Through this work, it was found that keitai has become a seemingly indispensable medium for Japanese youth. It appears that the same development is occurring among youth in Europe.

There are, of course, several elements that impact whether a person experiences stress and other psychosocial problems. However, ICT is one of the elements that contribute to a blurring of boundaries between work and leisure. When work can be easily performed in any environment (e.g., home, in public), it raises issues about the sense of freedom versus a feeling of responsibility. Moreover, it raises the question of our need to feel a clear boundary between work time and free time. One way to create a clear distinction between the professional role/work context and private role/home, is to become a less-frequent or non-user of ICT (cf. Nyberg, 2008). However, this might not always be a solution.

Another way to enable individuals to separate themselves from work, that is, create a clear boundary between work and leisure activities, is through design. Nowadays, the focus on aesthetics and user experience is increasingly in interactive design (see e.g. McCarthy and Wright, 2004, or Norman, 2004). There exist a number of user experience goals concerning how a system or interface feels for a user (Preece, Rogers, Sharp, 2007). These experience goals are subjective qualities that include both positive ones (e.g., satisfying, enjoyable, helpful, motivating and fun) and negative ones (e.g., boring, frustrating, annoying). Unlike past technologies that were designed towards a specific context of use, the ICT of today is applicable for several activities. Therefore, the design of ICT should focus on the purpose of the activity and create tools/services that can support the shift between both activities (work and leisure). To design and evaluate not only for usability, but also for user experience goals, a designer should understand the multifaceted and changing nature of the user’s experience of an activity which is dependent on time, place (Preece et al, 2007) and purpose. The young people of today, and especially today’s children, are born into a world where we use ICT anytime and anywhere when performing work and leisure activities. For example, we can easily use the same mobile phone both for professional and personal communication and ask for a “split” bill.

Therefore, we emphasize the possibility for the user to transition from work to leisure activities still using the same ICT. In order to enable use of the same ICT

in both contexts, users should be supported in their shift between these contexts and in their creation of a clear separation between them. This support should be enabled by ICT. In Japan, it is common for the workers to change the physical mobile phone (still using the same phone chip) on their way home from work. Their private mobile phones include the same phone numbers as their work phones but are personalized and somewhat more extreme in design and add-ons, whereas the professional mobile phone is more conservative and less conspicuous in appearance. This is an example of a strategy used in order to shift from work to leisure. However, it demands a change in the physical appearance in order to do so. Rather, it would be preferable to use indications, similar as those used in different communication systems (such as e.g. Skype or MSN), which would tell others if we are busy working or available. We stress that the shift between work and leisure should be supported through software services. Whereas different status modes tell others that we are working or not, we point out ways for the user to experience the context of work or leisure. Rather than suggesting new ways to inform others about what we are doing, we emphasize instead ways for the user to experience a clear separation between work and leisure even though the same ICT is used in both contexts. This proposal is somewhat in line with the research presented by Kohiyama (2006) in a paper discussing the term *personalization in communication* and showing trends in mobile communication in terms of the personalization of devices, connectivity, and services. Kohiyama (2006) explains:

'Personalization involves enabling access to the broadest possible range of who, what, where, when and how (4W1H) as well as enabling people to specify and restrict access based on their individual needs.' (page 71).

The “what” referred to means that we can access any type of information, but at the same time, through personalization, be able to filter information for individual needs. The “where” would initially refer to access from anywhere (work, home, city, countryside etc), but in relation to personalization it would enable us to restrict particular communications at particular locations. In terms of personalization and restriction of “when”, we could consider services where certain types of calls are blocked at certain times or information is delivered at a particular time of day (Kohiyama, 2006).

Doing so, ICT would be transformed from something that creates a blurring of the line between work and leisure activities, and instead create the experience of a clear shift between those contexts. Instead of being a cause of psychosocial stress and an unhealthy life environment, ICT can become a way to support an individual's recovery. By combining research involving psychology, work science and informatics, we have identified the need to further explore the impact ICT has on humans as they experience the blurring of boundaries between work and leisure. Future research concerning our psychosocial life environment should be approached on different levels and from different perspectives by using an interdisciplinary research process in order to analyze broad and important

questions like the ones presented in this paper. This is somewhat in line with Croon-Fors (2006) who argues that in order to envision the reflexive nature of information technology, the relationship between human experience and information technology must be comprehended as a whole.

Conclusions

In this paper we have presented effects that lead to the blurring of boundaries between work and leisure and have outlined some initial suggestions on how to continue research within this field. We have used an interdisciplinary research process that combined theories from the fields of Informatics, Psychology and Work Science focusing on the concepts of roles, environment, boundary, work, leisure, health and barriers.

A person's life environment (which combines different environments such as home, office, public place), life role (private, professional and citizen role) and social networks influence our psychosocial health. It appears that people who work professionally in the field of ICT, or use ICT to a lesser degree in their work, experience a blurring between their professional role and private role and have to develop coping strategies alone or together with friends and family in order to separate themselves from work. There are, of course, several aspects that impact whether a person experiences stress and other psychosocial problems, but it seems clear that ICT is one of these aspects that contributes to a blurring of boundaries between work and leisure.

We stress that rather than being an initiator of a stressful and unhealthy life environment, ICT could be designed to support the user in drawing a line between work and leisure in order to find time for renewal. It would imply the design of services in line with the term of *personalization of communication* presented by Kohiyama (2006), where we can have the fullest of possibilities, yet can personalize and restrict information and communication for the appropriate times and places.

In order to clarify the importance that this field of research has on our health and, by extension, our productivity, we would like to end with this thought. The directors of today's organizations set rules as to what kind of work employees get paid for doing and during what time frame. The other side of the equation is that it is primarily the *employee* who has the responsibility for getting the assigned work done in the time allotted. At the same time—and this is essential to keep in mind—the employee has both the *freedom* and the *responsibility* of setting aside adequate time in order to *recover* the necessary equilibrium for good health. In short, both parties must work together to assure the best possible result.

We find this to be a highly important area of research and underline the importance of continuing research within the field in an interdisciplinary manner in order to grasp a fuller picture of the challenges and constraints, possibilities

and solutions regarding the relationship between ICT and the psychosocial life environment.

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