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A double-edged sword?: a critical evaluation of the mobile phone in creating work–life balance

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This article provides a critical review of the literature on the impact of mobile telephony on work–life balance (WLB). In particular, it focuses on their theoretical frameworks, the nature of the research questions, the methodological choices adopted and the research findings of empirical articles published internationally between 1998 and 2014. This research field is at the crossroads of two theoretical and empirical traditions, and can be characterised by diversity in terms of conceptualisation and operationalisation of measures, which burdens comparisons between findings. Four problems arise with the literature: (1) the consistency and transparency of the theoretical bases they employ; (2) a tendency to technological determinism and to diminish the impact of human choices; (3) difficulty with handling the complexity of factors; and (4) issues with finding sampling strategies that do not restrict the ability to generalise and/or result in omission of specific populations.

Keywords: work–life balance, work and family conflict, work and family border, mobile telephony, information and communication technologies.

Introduction

According to the statistics from the United Nations, out of the world's estimated 7 billion people, 6 billion have access to cell phones, which represent a rate of penetration of eighty-five percent of the population of the planet as a whole. Considering that only 4.5 billion people have access to working toilets (U.N., 2013), we can conclude that the hygiene-related situation of many people is worse than their opportunity to communicate. Within just 40 years, mobile telephony has spread across and networked the world and become an important part of our everyday life, almost invisibly. Technology allows people to extend communication in terms of time and space, or—using the expressions of Manuel Castells—materially supports 'timeless time' and the 'space of flows' (Castells, 2009). With a single smartphone, one can use 'dead time' spent commuting by calling a family member or check emails during a

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holiday. The strict barriers between working time, family time and leisure time as defined elements of our days and the physical and mental borderlines between working place and home are fading away. Just how individuals balance the requirements of their careers and their private sphere is in itself an old area of academic enquiry, the role of information and communication technologies (ICTs) in work–life balancing strategies has only started receiving scrutiny in the past few years.

This literature review provides a structured summary of those empirical studies that seek to unveil the relationship between the use of mobile technologies and the creation of the work–life balance (WLB). These articles question what kinds of cause–effect mechanisms prevail, and whether they have positive or negative consequences on individuals. Although there are literature reviews available about the field of general WLB, these systematic analyses do not take a technological perspective. Casper and her colleagues (2007) reviewed empirical research published within industrial–organisational psychology and organisational behaviour journals between 1980 and 2003, while Chang *et al*. (2010) provide a critical study of 245 empirical articles published in a wider range of discipline-based, peer-reviewed journals from 1987 to 2006. Neither of these reviews separately discusses the role of mobile telephony from the perspective of WLB. This essay maintains a narrower focus and does not aspire to provide a widespread quantitative analysis of the literature. Without aiming to provide an exhaustive summary, this literature review concentrates on the most relevant sociological articles published in the last 15 years and is designed to reveal consistencies and contradictions in the literature. This review essay offers detailed introspection into a specific research field and not only synthesises the key findings but offers a critical outline of the most important discrepancies with the applied theoretical concepts, and identifies methodological problems.

The drivers and potential human consequences of WLB and the relationship between ICT use and social changes typically represent two distinct issues and have their own theoretical constructs, research questions and operationalisation, resulting in two large groups of empirical literature. The matter in question straddles these research domains. This literature review summarises how the theoretical bases are conceptualised, what the methodological choices are, how the research questions are formulated, what kind of variables are defined, how these are operationalised, what the sampling strategies are and finally, describes the main findings of selected articles published internationally between 1998 and 2014. It covers those articles that have described research into a larger group of ICT tools, including mobile phones, but does not cover articles that deal with ICT usage in general (i.e. those that do not take the WLB perspective), those that deal with the non-WLB-related content of ICT or mobile phone usage, and those that deal with the role of ICT and mobile telephony in maintaining family relationships or social capital, with parental control, with education or with work-related practices. The wide range of literature that discusses the social aspects of telework has also intentionally been left out of consideration.

Because this review essay aims to provide social researchers with a critical lens through which they can utilise current empirical WLB–ICT literature, its findings have been structured in accordance with the logic followed by most empirical studies. After introducing the methodology for performing this review, an overview follows about the applied theoretical frameworks that contain basic preconceptions for the empirical research. ICT-related theories determine how we handle the complex interrelation between technology and society, whether pessimistic or optimistic hypotheses are drawn up, and define the variables we take into consideration. WLB-related constructs guide our interpretations of phenomena like conflicts between work and private life, or the blurring boundaries between the life domains of work and nonwork. After introducing the middle-range theoretical constructs applied by the articles, the forthcoming section discusses how they conceptualise and operationalise these concepts and what the main problems are in connection with the measures employed. The next chapter summarises concrete research questions grouped according to empirical traditions. Four basic categories emerge: domestication- and user-oriented, organisation-

oriented, family-oriented and boundary-oriented research. In the next section, the various approaches taken in the research methods are elaborated upon; afterwards, the methodological choices and sampling strategies are discussed in separate sections. Finally, this review synthesises the key findings of the selected articles, unveils their contradictions and suggests new directions for research.

Methodology

In order to identify the relevant literature within, one major database collection was searched, (EBSCOHost), and the search engine Google Scholar was used. Articles not written in English were excluded, and a combination of the keywords 'work' and 'life' or 'home' or 'family' or 'balance' and 'mobile' or 'phone' or 'ICT' were used in the subject field for EBSCOHost. Google Scholar served as a supplementary tool and helped in identifying any additional literature. Because these keywords returned many irrelevant hits, the selection had to be made item by item based on the abstracts and in some cases, on full texts. Those full articles stood in the focus that introduced the results of empirical research and which had been published by a peer-reviewed journal. During the selection process, those sociological articles that discuss the relationship between the use of mobile technologies and creating a WLB from the perspective of the individual and the household were evaluated. This literature review thereby maintains a narrow focus and excludes articles that did not meet the thematic selection criteria. Omitting literature based on research into telework was also a conscious decision, because this issue involves a specific and characteristic way of working that requires a distinct set of telecommunication practices and extraordinary preconditions for work–life reconciliation. The wide range of studies about the WLB strategies of teleworkers [and the role of telecommunication therein (e.g. Othman *et al*., 2009; Gold and Mustafa, 2013))] may be a suitable subject for a dedicated empirical literature review.

After selection, an Excel data set of 30 articles was created into which several attributes of each item (author's name/s, title, publication year, publication source, summary, research questions and applied methodology) were recorded. During the analysis, a template method (Crabtree and Miller, 1999) was used that involved revising the texts of the selected articles several times and interpreting their theoretical frameworks, research questions, methodologies and findings as the major themes qualitatively rather than statistically. After identifying and analysing the identified themes within the articles, the findings were structured accordingly.

Constructs and measures about the effect of mobile telephone use on WLB

The subject of the interrelationship between WLB and mobile phone use is at the crossroads of two research fields. On the one hand, there are those theoretical constructs that elaborate the social effects of ICT use. On the other hand, there are those middle-range theories that describe changes in families from the perspective of WLB. Before discussing thematic focal areas and methodological choices, this section provides an overview of the kind of constructs and measures that are used by the articles in question.

Theoretical constructs about ICT use

Most of the empirical studies do not pay too much attention to clarifying explicitly the supposed relationship between technology and society. However, the hypotheses they employ and the applied research design they utilise can allow us to make inferences. One group of articles is based on the presumption that ICT affects society, thus technology is one of the elements that shape major social trends. This indicates an

unexpressed commitment to technological determinism (Mody *et al*., 2010), an approach which treats technology as a neutral separate field and provides a unidirectional explanatory model; viz. technology affects society (in WLB–ICT literature, this mainly relates to quantitative studies, e.g. Chesley, 2005; Diaz *et al*., 2012). Another portion of the studies considers technology to be interrelated with society; that is, to have a non-neutral effect. This theoretical school, called 'social shaping of technology' (MacKenzie and Wajcman, 1985; Williams and Edge, 1996; Bijker *et al*., 2012), interprets the connection between society and technology as an interactional relationship and highlights the importance of human choices (in WLB–ICT literature, this mainly involves qualitative studies, e.g. Golden and Geisler, 2007; Heijstra and Rafnsdottir, 2010, Matusik and Mickel, 2011 and a few quantitative studies, e.g. Hubers *et al*., 2011; Wajcman *et al*., 2008; Wajcman *et al*., 2010). The tradition of social shaping of technology refutes the hypothesis of technological determinism, and as an umbrella term, covers several different theories that explain and describe the relationship between technological development and social changes (Király, 2008; Lievrouw, 2010). This theoretical framework is in harmony with the supposition that people who have different perspectives about work–life relationships employ different mobile use-related strategies to handle conflicts between these two life domains (Sarker *et al*., 2012); moreover, the same person can approach mobile technology and work–life boundary management differently in different situations or at different times (Hislop and Axtell, 2011).

Measures of mobile phone use

Although WLB–ICT literature usually does not discuss ICT-related middle-range theories in detail, it does clarify the applied technological terms. ICTs usually involve more technological innovations: Internet-based communication, mobile devices, computer-generated telephony or other related solutions like transaction systems, groupware, workflow or multimedia (Valenduc and Vendramin, 2002). The Internet is at the centre of interest generally, and most studies only touch on the issue of mobile technology. The mobile phone as a device appears in two formats: a tool for voice-based communication and SMS messaging, and as a smartphone or a Blackberry, which provides mobile internet, particularly email communication. Mobile internet connection over computer (notebook, tablet, etc.) is discussed as a separate technology, as are convergent mobile devices (CMDs) such as personal digital assistants (PDAs). Articles thus have relatively standard definitions for the domain of ICT and operationalise usage generally in terms of frequency (e.g. average number of text messages sent or received per day, number of incoming or outgoing phone calls a day) or time (e.g. hours spent on using the Internet). Because mobile technology does not exist in isolation but as a part of a variety of communication technologies (Palackal *et al*., 2011), researchers usually handle mobile communication with other ICT uses together. Thus, mobile phones usually appear as an element of the 'ICT cluster', and many findings refer to this bigger group of tools. Leung (2011), for example, uses a multidimensional construct, the 'ICT connectedness index' (ICTCI), which reflects a multilevel and contextual approach. ICTCI includes not only the frequency but also the scope and intensity (e.g. range of applications, job requirements related to media use), centrality and goal (subjective evaluation of the importance of ICTs), and breadth (access to different technologies) of ICT use at home.

Problems with conceptualisation

In focusing only on one tool with a view to unveiling its autonomous role, we must face up to the fact that ICT tools are used in an integrated way, and also deal with the phenomenon of media convergence. Media convergence means the integration of data communications, telecommunication and mass communication into a composite infrastructure that uses a combination of sign systems and data types (Baldwin *et al*., 1997).

Within mobile communication, the smartphone is an example of this phenomenon: a single device that enables (1) data communication (access to emails), (2) telecommunication (receipt of phone calls) and (3) mass communication (access to online news). Some mobile phones provide more opportunities for communication (Skype, Viber, email, Facebook chat, etc.), while it is also true that the ability to 'make a phone call' no longer exclusively refers to the use of a mobile phone (i.e. Voice-over-Internet Protocol, VoIP). Users are usually not aware of the infrastructural backgrounds behind these options but they can make distinctions between the devices and the functions. Accordingly, WLB–ICT research does not apply an infrastructure-based analytical perspective but categorises the use of mobile phones according to the purpose they are used for. Using this approach, the smartphone provides (1) access to information, (2) entertainment and (3) relationship building. Empirical studies related to the WLB focus on this last function and generally treat the mobile phone either as a device that provides the opportunity for receiving or initiating phone calls and text messages, or as a smartphone that makes Internet, most particularly email communication, available. Articles show a kind of uniformity in this regard, although some of them deal with specific devices and others with groups of devices. In sum, we can state that the conceptualisation of ICT or mobile use does not seem to be problematic in the literature.

Social theoretical constructs of WLB

The definitions applied to WLB and the related theoretical frameworks are on the contrary more diverse and result in problems with consistent conceptualisation and operationalisation. The distinction between the realm of 'work' (which covers earning activities usually related to different forms of employment) and the other realm, usually called 'life' or 'domestic life' (e.g. Diaz *et al*., 2012), 'private life' (Frissen, 2000), 'nonwork' (e.g. Tennakoon, 2007), 'home' (e.g. Clark, 2002; Wajcman *et al*., 2008) or 'family' (e.g. Chesley, 2005), varies depending on what is emphasised. Some studies stress the family unit and focus on the activities, tasks and responsibilities related to children, spouses, elderly people or other relatives (e.g. Chesley, 2005; Christensen, 2009). Other studies call the domestic life arena 'home', indicating that the separation is more physical and temporal (e.g. Clark, 2002; Wajcman *et al*., 2008). Here, the role of 'breadwinner' and 'homemaker' can coincide—or conflict. The exact terminology that is used has major importance in empirical analysis because it also appears in questionnaires or interview guidelines and thus influences the answers of respondents.

Interpretations of the relationship between the two life domains are also diverse and depend on the applied theoretical frameworks. Two middle-range theories dominate the empirical literature: spillover theory and border theory.[1] Both theories agree that conflict can occur between the two domains and researchers are continually striving to reduce this lack of theoretical clarity. Both theories provide similar concepts for blurred boundaries and the perceived balance between life and work. The first theory states that the line of demarcation between work and nonwork is not strict and well-defined. Although 'work' may be separated from 'home' in terms of time and space, individuals' behaviour, emotions, attitudes, values and skills can blur the boundaries and have positive or negative consequences on people (Staines, 1980). The second theoretical conception argues that the primary connection between work and family systems is not emotional, but human. People are border-crossers and make daily transitions between the two worlds; they shape their environments and they are also shaped by them. Border-crossers, who make frequent transitions between work and family domains, negotiate and cross boundaries and construct the demarcation line. There are also border-keepers, who are especially influential in defining both domains and the border, and other domain members can also play a role in creating the WLB (Clark, 2000).

Measures of WLB

Studies that use spillover theory as a conceptual framework focus on the lack of a domain border and the separation between the two domains. Spillover theory proposes

that there is a relationship between work and home environments, such that work patterns and experiences in one domain are carried over into the other through a permeable boundary (Zedeck, 1992). Articles describe research that has attempted to measure work-to-family and family-to-work spillover depending on the direction of permeation. Both directions of spillover have positive and negative effects, depending on their outcomes on individuals (e.g. satisfaction or distress) (Martinengo, 2007). Negative work-to-family spillover is captured in statements like 'because of my work responsibilities I have missed out on home/family activities that I would have liked to have taken part in' and 'because of my work responsibilities my home/family time is less enjoyable and more pressured' (Wajcman *et al*., 2010)—or 'your job keeps you away from your family too much' (Leung, 2011). The extent of negative family-to-work spillover can be captured by agreement with sentences such as 'to what degree do worries and problems at home cause you to spend less time at work than you need or want to'; 'personal and family worries and problems distract you when you are at work'; how much 'activities and chores at home prevent you from getting the amount of sleep you need to do your job well' (Leung, 2011); or to what extent a respondent agrees that 'because of my home/family responsibilities I have to turn down work or opportunities I would prefer to take on', or 'because of my home/family responsibilities the same time I spend working is less enjoyable and more pressured' (Wajcman *et al*., 2010). Although positive forms of spillover can theoretically also exist, empirical articles pay less attention to them.

Based on the other concept, work–family border theory-related articles conceptualise the borders between work and family as physical, temporal and psychological demarcation lines. One of the characteristics of these borders is permeability, which is the degree to which psychological or behavioural aspects of one domain may enter another. Physical and temporal permeability appears when a person works from home and family members are accustomed to interrupting them frequently. Psychological permeation appears when, for example, a negative emotion or attitude is transferred from work to home life, but also when ideas and insights used in one situation are transferred to another. For example, a nurse learns teamwork skills at her workplace and adopts these techniques at home to increase the family's ability to work together, or an individual deliberately tries to be more courteous and positive about others' successes at work (their normal attitude at home) to lend support to competitive group work (Clark, 2000). In sum, communicating with, dealing with or thinking about family members at work, or the opposite, communicating with colleagues, dealing with or thinking about job-related projects at home are common measures of permeability (e.g. Clark, 2002; Leung, 2011).

The other widely used quality indicator for boundaries is flexibility, the extent to which a border may contract or expand depending on the demands of one domain (Clark, 2000). Freedom to choose when one's working time starts and finishes and its location (e.g. Heijstra and Rafnsdottir, 2010), the option of choosing when to take a vacation or doing nonwork projects during spare time at work are common variables that are used to measure flexibility (e.g. Leung, 2011).

Border theory also defines the phenomenon of blending, which occurs when high levels of permeability and flexibility exist within borders (Clark, 2000). This enables an overlap between the two domains that can result in tension—or an increase in efficiency. For example, physical blending occurs when a person uses a notebook and Internet at home to complete work-related tasks while he or she takes care of a sick child. Although ICT makes it easy to create a borderland that cannot be exclusively called either domain, research typically does not conceptualise this status. Border theory also defines the strength of the borders as a combination of permeability, flexibility and blending, but this measure is also usually left out of consideration.

Besides these measures, further variables are involved, either as dependent or independent variables. They include quality of life (e.g. Valenduc and Vendramin, 2002), family satisfaction (e.g. Chesley, 2005; Leung, 2011), work satisfaction (e.g. Currie and Eveline, 2010; Leung, 2011; Diaz *et al*., 2012), burnout (Leung, 2011), anxieties (Chesley, 2005), distress (Chesley, 2005), flexibility of the domains (Valenduc and Vendramin,

2002; Heijstra and Rafnsdottir, 2010; Leung, 2011), flexibility of ICT use (Diaz *et al*., 2012), coping strategies (Hubers *et al*., 2011) and gender (e.g. Chesley, 2005; Golden and Geisler, 2007; Tennakoon, 2007; Heijstra and Rafnsdottir, 2010; Wajcman *et al*., 2010).

Problems with conceptualisation and operationalisation: providing consistency and transparency

As the concept of spillover is interpreted similarly to border theory's notion of permeability, choosing between the two theoretical frameworks is not always easy or clear cut. Some articles use permeability as the most important characteristic of the border and call two-way permeability spillover. Others conceptualise spillover as a separate term. For example, Leung (2011) uses the perception of permeability as a variable and creates hypotheses about the connection between permeability and negative spillovers through borders, while Tennakoon (2007) uses the interactivity of the two domains as a measure of permeable borders and characterises it with work-to-family and family-to-work spillover. My interpretation is that the use of e.g. Blackberrys makes borders permeable because it makes it possible for the individual to remain available to her employer anytime, anywhere. This creates the opportunity for a work-to-family spillover. The use of a mobile phone does the same in the other direction (family-to-work spillover) when it enables parents to keep track of their children during working time and to attend to household activities through third-party intervention (e.g. to manage a babysitter).

Problems with explanations: going beyond technological determinism

After having discussed how ICT use, border permeability, flexibility and spillovers as distinct variables can be measured, it is worth investigating how the connection between ICT and society can be statistically revealed and interpreted. If we experience that a greater amount of mobile phone use is correlated to a higher incidence of job burnout or a lower level of family satisfaction, this does not necessarily mean that the two variables are causally related. While, for example, Diaz *et al*. (2012) connects ICT flexibility (the perception that communication technologies provide flexibility in conducting work) and ICT usage (in terms of quantity) directly with work satisfaction and work-to-life conflict, different structures for the variables are also imaginable. For example, Leung (2011) builds up a regression model that implies causality from ICT connectedness through permeability and flexibility that affects spillovers and finally job burnout and job/family satisfaction. His regression analysis identifies other variables that explain family satisfaction and job burnout (such as age, family income and working hours).

The relationship between ICT use and general WLB is even more problematic statistically. In order to handle the effects of several neglected factors, researchers can use one combined variable to examine the relationship between ICT and the perception of WLB. For example, Judy Wajcman and her colleagues analysed data from a survey question asking about the impact of the Internet (Wajcman *et al*., 2010) and mobile phone use (Wajcman *et al*., 2008) on respondents' ability to balance their work and home life, and Currie and Eveline (2010) operationalised this question by asking to what extent respondents agreed that 'Using e-technologies at home made it easier to manage a young family alongside work tasks'. The advantages of these survey questions are that they do not make it necessary to filter out the effects of other variables because they indicate a perceived ICT–WLB relationship directly, and they can thus be used in regression analysis in a simple way.

The other advantage of this approach is that it does not treat the individual as someone who suffers from the impacts of technological development, but puts the emphasis on the choices humans make. Mobile phone use can increase permeability between the two domains, but at the same time can also be a tool for controlling 'over the border' activity and can help delineate the two domains (e.g. switching a phone off

outside working hours). Greater use of mobile phones can mean both higher and lower levels of WLB so the main questions are whether the individual *perceives* the use of a mobile phone to be supportive or a hindrance in terms of creating WLB and what kind of strategies he or she applies to utilise the advantages or reduce the disadvantages. This has relevance to the selection of the applied theoretical frameworks: viz. to the importance of considering the role played by human choice instead of applying an overly simplistic approach that assumes a unidirectional relationship between technology and society.

In closing this section, it can be stated that the two problems that arise in the literature discussed are related to the applied theoretical constructs and their operationalisation and conceptualisation. Firstly, theoretical assumptions are usually not made explicit, and studies do not show consistency and transparency from this perspective. Secondly, the majority of articles disregard the range of options that the individual has in terms of their use of technology. Correspondingly, research that puts the emphasis on human choices paves the way for development in this field.

After having overviewed and identified the theories, concepts and measures applied by the reviewed articles, we now step forward and address their concrete subject matters.

Research questions

This section summarises the main research questions in the ICT–WLB empirical literature. Because ICT use has changed a lot over time, research questions and hypotheses have also developed. Early research projects are less focused; they cover more issues and discuss more general questions. Representatives of this early literature include Leslie Haddon and Roger Silverston who developed a user-oriented perspective (e.g. Silverstone and Hirsch, 1992, Silverstone and Haddon, 1996). These studies provide insight into the adoption of the mobile phone during the late 90s. They apply the concept of 'domestication' to analyse the complex process by which technology has modified household routines and practices. The qualitative empirical studies conducted by Haddon and Silverstone in the UK unveil the role of the mobile phone in (1) work-related mobility, (2) the management of contactability through mobile phone and (3) the rules of using mobile phones in public spaces (Haddon, 1998). The first issue covers the consequences of permanent availability and the potential for flexible work that became major interests for later organisation-oriented research and WLB literature. The first issue also involves telework, which was developed later into a separate area of investigation. The second direction is more about how people can influence each other at a distance. Questions such as how intra- and extra-family relations are modified belong here. Later in the literature, the discovery of family networks and their embeddedness into the wider social network became a separate issue. The third topic is about the symbolic dimension of ICTs and is more related to the consumption literature.

Domestication and user-oriented research questions

The concept of domestication unveils the ambivalent and paradoxical processes of acceptance and the use of ICT. A qualitative study conducted by Frissen (2000) among Holland dual-income families with children focused on everyday practices and routines: the patterns, acceptance, use and meaning of ICTs. In terms of use, a central question is whether households use ICTs for solving time and coordination problems in everyday life. In terms of acceptance, the factors of the slow-down effect are investigated (like ambiguous feelings related to continuous accessibility, or the social unacceptability of using ICTs in public spaces and the positive potential of telework). In terms of patterns of use, gender differences are discussed. They include consideration of the differences between men and women in how they experience the shifting boundaries between home and work through ICTs.

The explorative study of Tennakoon (2007) investigates how employees use ICT devices, whether there are any differences among users and what the role of ICTs in managing WLB is. The user-oriented study focused on the boundary-blurring phenomenon and applied the notions of border theory and spillover theory.

Another user-oriented piece of research was conducted by Wajcman *et al*. (2008) in Australia. This focused on how individuals and households use mobile phones to integrate the different dimensions of everyday life. The study gathered detailed information about how dependent users are on their mobile phone for work or other purposes, how important mobile phones are for coordinating their personal lives and under what circumstances users attempt to control contact via the device. The research described in the article also asked the question whether mobile phones help or hinder individuals' efforts to manage work and family. A similar research question was asked by Heijstra and Rafnsdottir (2010) who analysed whether the Internet and other ICT technologies, like mobile phones, support the work/family balance of academics, while Currie and Eveline (2010) investigated the effects of ICTs on the WLB of academics with young children in Australia.

The association between the frequency of use of mobile phones and the composition of the core network (the share of family and work relationships) was studied by Palackal and his colleagues (2011) in India. This network approach allows us to reveal the potential effects of technology on the maintenance and building of professional and family relationships.

Organisation-oriented research questions

In the frame of a European research project (FLEXCOT), Valenduc and Vendramin (2002) go beyond user-centrism and provide an organisational point of view. Their research questioned how ICT contributes to the expansion and diversification of flexible working practices, and how these can improve quality of life and help design the concept of socially sustainable flexibility. The study conceptualises work flexibility in terms of time, location and function. Diaz and his colleagues (2012) examined the relationship between employees' attitudes to ICT flexibility (the extent to which respondents think that communication technology can provide employees with more flexibility to do their work), ICT use, work–life conflict and work satisfaction.

In their exploratory study, Matusik and Mickel investigated users' experiences and reactions with CMDs within the work domain and identified a number of different factors that influence users' reactions. Although the work environment is at the focus of this research, it has implications also related to WLB. Other work-centred research has been undertaken by Hislop and Axtell (2011) who investigated how non-managerial engineers make use of work-related mobile communication technologies both during working time and outside it, and by Townsend and Batchelor (2005), who investigated the convergence of work and nonwork domains and the role of mobile phones in it. Sarker and his colleagues (2012) go beyond the perspective of the individual and investigate also the strategies of organisations regarding how they address WLB issues related to the use of mobile technologies.

Family-oriented research questions

A family-oriented point of view is applied by Christensen (2009) who investigates the role of ICT, more precisely, how cell phones are used in communication between parents and children and how the device is used to mediate a feeling of closeness while family members are physically separated. Adeoye and his colleagues (2010) researched Nigerian families to examine the nature of ICT use in their lives and to see whether ICT tools (cell phones and Internet) had positive or negative effects on families.

Boundary-related research questions

The relationship between spillover and ICT connectedness seems obvious, if we keep theoretical frameworks clear. In principle, ICT devices are able to extend communications over time and space and increase access to individuals that acts to blur the boundaries between work and home. ICT use can be correlated as an independent variable directly to negative or positive spillovers. Positive spillover then can be the explanatory variable for higher quality of life or a decrease in feelings of anxiety, while negative spillovers can be the explanatory variable for job burnout and increased job or family dissatisfaction. Chesley (2005) tests whether ICT usage is related to changes in levels of personal distress and family satisfaction through increased levels of spillover. Leung (2011), meanwhile, mixes the concepts of spillover and border theory and links ICT connectedness as an explanatory variable to negative spillovers (work to home and home to work) through increased permeability and flexibility. The author also investigates the effects of spillover on job burnout and job and family satisfaction.

The border theory concept has paved the way for new research questions on this topic. In an article from 2002, Clark (2002) examined the amount of communication that takes place across home and family borders. Instead of employing a user-oriented, tool-centric approach, she takes a thematic focus and questions the effect of work or family-related communications with family or work domain members on the feeling of being valued in a domain, being empowered to carry out domain activities and the perception of work/family balance. She investigates the effect of border flexibility and permeability on the frequency of WLB-related communication. Based on this concept, Golden and Geisler (2007) research work-life boundary management and focus on one particular device, the PDA.

ICT-related coping strategies and their adoption are the focus of research by Christa Hubers and her colleagues who questioned whether new ICT-enabled strategies are being adopted, by whom and how this affects the adoption of other kinds of strategies. Additionally, the research investigated whether ICT usage complements or substitutes for other coping strategies (Hubers *et al*., 2011).

Problems with research questions and hypotheses: handling complexity

As it can be seen by the diversity of research questions and the investigated phenomena, the intersection of ICT use and WLB as research fields results in a narrow but quite complex arena of interest. The variety of ICT tools used by the individuals (e.g. the use of mobile phones and the internet for different purposes and with different patterns of use, sometimes complimentary but sometimes supplementary) produces an interaction between factors that make it difficult for the researcher to focus on a single device. The WLB question can also be approached from different perspectives (e.g. life coordination, quality of life, work or family satisfaction, job burnout, etc.), which leads to the need to include a wide range of variables that may have causal relationships (e.g. between negative work-to-life spillover and life satisfaction, between border permeability and negative work-to-life spillover, and between negative work-to-life spillover and job dissatisfaction or job burnout). These relationships can be also influenced by other non-ICT or non-WLB-related (e.g. demographic or situational) factors that should be also taken into consideration.

In closing this section, it can be stated that handling such complexity is one of the greatest challenges that a researcher has to face in this field. Well-designed research methods can help to overcome these challenges. This conclusion leads us to the next section of the article.

Methodological choices

Empirical articles from the literature can be divided into two groups, qualitative and quantitative, based on the methodological paradigm they follow. Because most of the research takes the form of explorative studies in this field, qualitative methods like

semi-structured interviews (e.g. Christensen, 2009; Heijstra and Rafnsdottir, 2010, Palackal *et al*., 2011, Sayah, 2013), case studies (e.g. Frissen, 2000; Valenduc and Vendramin, 2002; Townsend and Batchelor, 2005; Hislop and Axtell, 2011) and field research (Sarker *et al*., 2012) are widely found throughout the literature. They offer rich depictions of the discussed social phenomenon and help with understanding the role of ICT in harmonising or managing conflicts between the life domains of work and family. These small-scale studies provide detailed examples of individual strategies; they help with understanding patterns of behaviour, with placing the ICT-related practices into a wider social context, eliminating the contradictions in quantitative findings, phrasing hypotheses that can be tested quantitatively in the frame of later research and giving hints about possible future trends. These methodologies, however, do not provide data that would allow scholars to generalise about larger populations.

This, however, can be accomplished using large-scale quantitative research. Telephone surveys (e.g. Chesley, 2005; Golden and Geisler, 2007; Wajcman *et al*., 2010; Leung, 2011) make it possible to interview employees who are spatially distributed. ICT usage diaries (Frissen, 2000; Wajcman *et al*., 2008; Currie and Eveline, 2010), phone logs (Wajcman *et al*., 2008), observations (Frissen, 2000), mental mapping (Frissen, 2000) and network diagrams (Frissen, 2000) are also applied as supplementary methodologies in the frame of methodological triangulation. The first two can provide significant added value to a survey or to in-depth interviews because they give objective and reliable information about (for example) the frequency, the length and the purpose of mobile communication or Internet use; these variables are difficult to measure using a questionnaire as respondents' estimations do not necessarily accurately reflect reality.

The advantage of employing mixed methods is that it allows researchers to consider multiple viewpoints, perspectives, positions and standpoints. Mixed methods combine elements of qualitative and quantitative research approaches for the broad purposes of adding breadth and depth of understanding and corroboration. One of their disadvantages, however, is that the design process can become a challenge because of the inherent complexity of these approaches (Johnson *et al*., 2007).

Problems with sampling strategies: avoiding restrictions

Considering that the problem of WLB is most evident among families with children living at home, many studies focus on this specific target group (e.g. Frissen, 2000; Christensen, 2009, Maruyama *et al*., 2009). This results in a reasonable but yet significant reduction in the statistical population as relevant groups of people who have other but still significant family responsibilities (i.e. taking care of another family member such as an elderly parent or a disabled spouse) or who have significant amounts of work (more than 60 hours per week) are not involved systematically. In other cases, the availability of the sample determines sampling strategies. For example, university students may be asked to participate in a quantitative survey (Adeoye *et al*., 2010), a qualitative study for extra credit points (Clark, 2002) or the population may consist of non-academic managers of a university (Diaz *et al*., 2012). Although the sample size was 570 respondents in the first example above, 179 respondents in the second and 193 in the third case, these samples do not demographically represent a larger population, which gives rise to problems in interpreting them more widely.

Selecting a sample from different organisations that represent a range of industries and sizes (Chesley, 2005, Palackal *et al*., 2011) can generate a pool of relevant data, although the fact that the sample may only include individuals who are currently employed and have a partner means a significant reduction in sample size.

Besides availability, characteristics of family structure (e.g. 'have children' in Currie and Eveline, 2010) and characteristics of employment are also used as selection criteria. Non-managerial workforce (Hislop and Axtell, 2011), executive level employees, who are usually not covered by overtime legislation (Tennakoon, 2007), individual contractors (Sayah, 2013), mobile workers, who work away from home (Sarker *et al*., 2012), and academics, who generally have high levels of work flexibility and autonomy (e.g.

Currie and Eveline, 2010; Heijstra and Rafnsdottir, 2010), prove to be sensible target groups because they usually have conflicting work and life domains and are heavy ICT users, thus their experience with the effects of ICTs on WLB is more intense than average. Findings in connection with these target groups cannot be generalised to a wider population, but can reveal social practices.

In conclusion, it can be seen that the fourth problem that may be identified in the literature is that research in this field has tended to focus on certain groups of society—while others are left out of consideration completely. Researchers select populations primarily based on the assumptions they make about the level of tension between work and life domains and ICT use patterns. Including other populations from outside, these typically affected social groups can lead to surprising findings—promising avenues for future research.

After having provided a critical review of the applied conceptual frameworks, the nature of the research questions and the methodological choices made in WLB–ICT literature, their findings can now be summarised. Although comparison and synthesis are often hindered by conceptualisation and/or population-related issues, it is possible to delineate some basic trends and relationships.

Findings from the literature

This section now covers the main findings of the reviewed empirical articles organised into four subsections. First, the early studies and their findings are summarised about the role of mobile communication and ICT tools in the everyday lives of individuals and how the importance of work and home environment and their relationship have changed over time in the literature. Then this essay provides details about the general evaluation of the relationship between using ICTs (and mobile phones) and creating a WLB. The third subsection unveils how mobile phones and ICT affect work and life satisfaction through border permeability and spillover, and describes what kinds of other factors have to be taken into consideration. Finally, details about research findings that unveil how mobile phones and ICT influence the management of the work–life border are presented.

ICTs: work versus home

Silverstone and Haddon (1996) distinguish three stages in the domestication process of ICTs (bringing the technology home): commodification (technology appears as a product on the market), appropriation (consumer takes the technology home and gets familiar with it) and conversion (signalling consumption to others). When mobile penetration was low and increasing quickly, studies focused on these stages of the domestication process and revealed the reasons for buying new ICT tools and described patterns of use. It was plausible to consider mobile phone as alternatives to landline phones. As work instruments, they changed the lives of 'nomadic workers' and their use was described as a way to facilitate efficient, short, official communication (de Gourney *et al*., 1997). During the next stage, when technology became more familiar and individuals were giving it a place in the physical and sociocultural environment of the home, the process of the incorporation of mobile phones into the everyday lives of households became an issue. Later research showed that the initially 'work-centric' mobile phone had become a device used more for social contact than for work (Haddon, 1998; Tennakoon, 2007; Wajcman *et al*., 2008). As mobile penetration increased, the different spheres of life became equally important in terms of ICT usage, and the blurring of boundaries between work and family became a major issue.

ICTs: good versus bad

Articles generally interpret the relationship between using ICTs (and mobile phones) and the creation of WLB as a social compromise, recognising both the positive and the

negative sides. These analyses typically avoid being either extremely optimistic or pessimistic, but aim to present a realistic picture that includes describing a combination of the advantages and disadvantages of ICTs. The positive effects of the use of ICT (including mobile phone usage) are that it can solve time and coordination problems in everyday life, can increase the users' sense of autonomy (e.g. Cavazotte *et al*., 2014), flexibility (e.g. Heijstra and Rafnsdottir, 2010; Cavazotte *et al*., 2014) and control (Golden and Geisler, 2007), support collaboration (Matusik and Mickel, 2011) and have the potential to increase mobility and interactivity (Townsend and Batchelor, 2005) as well as save time. Maintaining a distance from work and strengthening kin and informal relationships, as well as working from home and managing tasks that fall outside official working hours (Wajcman *et al*., 2008), can all be facilitated using mobile phones. The question whether users indeed perceive the effect of the use of ICT to be positive is, however, a separate issue (Frissen, 2000). Articles that explore the negative effects of mobile use on WLB (e.g. Matusik and Mickel, 2011; Sarker *et al*., 2012) highlight the fact that mobile phone use raises the expectation that one should be constantly available, blurs work–life boundaries, decreases efficiency and enhances feelings of conflict and of work-related stress around the clock.

ICTs versus other factors

Empirical evidence shows that ICT use and life satisfaction can be linked to positive spillover, while tensions and distress can be correlated to negative spillover; however, many other factors also have an influence. Chesley's (2005) empirical results show that persistent use of communications technology is associated with greater work/family boundary permeability and with increased spillover that appears to take on primarily negative forms. Persistent use of communications technology (rather than the use of computer-based technologies themselves) is associated with increases in distress and decreases in family satisfaction that can be explained by increases in negative work-to-family spillover. Wajcman and her colleagues (2008) go further and provide evidence that mobile phone usage cannot be associated with increased work-to-family spillover in itself. This type of spillover is influenced more by job characteristics, family type and age. Empirical research also proves that people who use ICTs more flexibly are generally more engaged in ICT use, which is associated with higher work satisfaction on one hand, but a higher level of work–life conflict on the other (Diaz *et al*., 2012).

Through negative work-to-family spillover, ICT can be connected to burnout and job dissatisfaction, and decreases in family satisfaction too. The evidence presented in Leung's study, however, proved that ICTs are as important as other factors (such as demographics, permeability and flexibility) in predicting negative spillovers in both directions. Through ICT use, people are continuously connected to their working environments, which has an impact on feelings of burnout and also job and family satisfaction. Leung (2011) identified a total of eight predictors to explain job satisfaction: age, family income, work hours, flexibility of work environment, border permeability, work-to-home spillover, the perception that Internet helps accomplish work-related tasks and the use of traditional media to relax after work. People who are satisfied with their jobs tend to be older and have impermeable boundaries that help them prevent work from penetrating their homes. Data also show that young females with mobile phone access are the most likely to become burned out with their jobs because of the high level of negative spillovers in both directions, with highly permeable boundaries between work and home and little flexibility at work.

Increases in negative family-to-work spillover can be also related to persistent use of communications technology, but this occurs primarily with women, not men, according to the findings of Chesley (2005), which indicates that communication technology use is reinforcing gendered work/family boundaries. Tennakoon (2007) proved that from all the types of ICT, the main family-to-work spillover is experienced through mobile phones when they are used in family-related matters. For academics, mobile

phones give a sense of security in that the users are easily accessible to their children and phones help them stay in close contact with home when they are abroad for work (Heijstra and Rafnsdottir, 2010). Additionally, mobile phones provide new ways of managing interpersonal relations within the family. They can mediate feelings of closeness while family members are physically separated, as parents and children can make frequent calls to each other. This leads to the experience of 'connected presence' (Licoppe, 2004) where management of relationships happens through mediated communication during physical absence. Connected presence brings people together (Adeoye *et al*., 2010), but it can also act to disperse family members (e.g. Christensen, 2009).

ICTs: integration versus segmentation

Research shows that as a response to intensification of work, academics are trying to erect barriers to stop work from affecting their private lives (Currie and Eveline, 2010). 'The invasion of privacy' (Tennakoon, 2007: 559) and the desire to not 'be out of touch' during holidays can create tension for individuals. Research by Heijstra and Rafnsdottir (2010) shows that academics would prefer to go on holiday somewhere where there is no Internet or mobile phone connection at all in order not to be tempted to check work-related items. In these situations, having control means that people maintain a distance between home and work (Wajcman *et al*., 2008).

Articles about managing work–life boundaries draw our attention to the fact that ICTs provide new strategic tools for coping with everyday difficulties in fighting for a better WLB. According to a descriptive study by Golden and Geisler (2007), users interpret their use of PDAs as being a way to control the work–life boundary through integration and segmentation of work and personal life. Individuals seem to be managing the flexibility and permeability of work–life boundaries in both directions. Another study shows that wireless Internet and mobile phones give academics the opportunity to optimise their flexibility and make available alternative places to work, like their homes (Heijstra and Rafnsdottir, 2010). In contrast, Matusik and Mickel (2011) find that in response to responsiveness–accessibility expectations, converged mobile device (e.g. smartphone, BlackBerry) users engage in behaviours and strategies that may result in work–life conflict, while Hislop and Axtell (2011) have provided evidence that the way non-managerial engineers use their mobile phones during working hours results in the work/nonwork boundary becoming blurred and unclear on a regular basis. They state that people cannot be considered consistent 'segmentors' or 'integrators' as they may adopt different boundary management strategies at different times. Sayah (2013) also suggests that individuals actively use multiple ICT-mediated tactics to shape their temporal, spatial and psychological work–life boundaries, and they may have diverse preferences with regard to both the dimension (temporal, spatial or psychological) and direction (work to life or life to work) of boundary permeability. Sarker and his colleagues (2012) suggest that these preferences and the different perspectives on work–life relationships should be considered in workforce management by organisations and a tailor-made plan should be put in place for each individual employee. According to Hubers and her colleagues (2011), these ICT-related strategies supplement other work–life strategies so they can be examined in conjunction with the non-ICT-related coping strategies that people have adopted. Three conditions—possession, affordability and ICT skills—may also influence people's choices.

In conclusion, it can be said that comparing research findings is sometimes difficult particularly because of the discrepancies that arise in the conceptualisation and operationalisation of measures, because of the limited range of ICT tools that have been investigated and because of the diverse yet limited variety of research populations. Correspondingly, although general research trends and variable relationships may be identified, there are contradictions between research findings.

Conclusion

Empirical studies about the relationship between mobile use and creating WLB may be challenged in four basic ways. First of all, they often use different WLB-related theoretical foundations, which results in inconsistency in the research approaches and hinders comparison of results. Second, the majority of the studies are predicated on technological determinism, an approach which neglects or undervalues the impacts of human choices. Third, research in this field has to handle a high level of complexity in terms of social and technology-related factors. This creates significant methodological challenges for researchers. Fourth, even the results of the application of well-designed methodology can be of restricted validity, if the investigated population is too strongly fitted to commonly or easily available sample populations, or to the assumptions of the researcher about the most affected social groups. Thus, selection of population and design of sampling method are also problematic.

Addressing each of these issues in turn, we can turn to consider the theoretical foundation of WLB research. The differences in the two competing theories (border and spillover) lead to differences in terms of how and which variables are incorporated into the research efforts. This creates problems with comparing the findings of the studies. The greatest area of similarity is with the notion of permeation (border theory) and spillover (spillover theory), as both refer to transitions across the boundaries. However, permeability is on the one hand interpreted in the literature as being a *characteristic* of the border, in contrast to spillover which is usually considered to be *psychological movement* across the border (e.g. Leung, 2011). However, border permeation has both psychological and physical and temporal aspects by definition (Clark, 2000), and is also used as a synonym for two-way spillovers (e.g. Tennakoon, 2007). The message from this literature review in this regard is that researchers should be more transparent about which theoretical framework is being applied and avoid mixing terms and definitions that can lead to inconsistency in interpretation and difficulties with comparing findings.

The other problem that has been identified is that ICT-related quantitative research studies about WLB tend to investigate the relationship between technology and society using the perspective of technological determinism (e.g. Chesley, 2005; Diaz *et al*., 2012), although it is clear that society accommodates itself to new opportunities and difficulties. Although qualitative research seem to be successfully handling the interrelationship between technology and society (e.g. Hislop and Axtell, 2011; Matusik and Mickel, 2011), there is a room to embed this theoretical approach into quantitative research. Investigating how people change their ICT usage and establishing claims to ICT that feedback into technological development are likely to be fruitful areas for future research. Research questions such as how do people create new coping strategies, manage borders and maintain control over life domains (e.g. Hubers *et al*., 2011; Sarker *et al*., 2012) take these factors into consideration and help with identifying not only present challenges but future developments too. It is conceivable that because of technological development to changes in labour markets and to other processes, the domains of work and life will change so much that the notion of blurred boundaries will become irrelevant in the future and that new approaches and the implementation of new definitions will be required.

It is also a problem that even if we narrow the examination of ICT's social effects to the relationship between mobile phone use and WLB, it remains a highly complex issue that involves the complex interaction of several factors that are hard to independently define. The use of other ICTs like the Internet and laptops, as well as working environments, family types and living conditions, can influence the interference that occurs between work and home, as can the role that mobile phones play in influencing an individuals' opportunities and strategies for balancing these two life domains. The correct theoretical frameworks, well-designed methodology and a choice of suitably structured variables are equally important for unveiling cause–effect relationships and interactions.

This literature review highlights the fact that research has employed both qualitative and quantitative approaches, but the methodology applied typically requires

an 'either-or' decision. Even the research that has simultaneously used multiple methods (e.g. survey, ICT use diaries and phone log-ins Wajcman *et al*., 2008) typically remains within one methodological paradigm.[2] Going beyond the traditional approaches of qualitative and quantitative methodologies and incorporating them in the frame of a new methodological paradigm are the roles for future research. The use of mixed methods (e.g. Hesse-Biber, 2010; Creswell and Plano Clark, 2011) is becoming increasingly popular within sociological research and models like 'convergent parallel design', 'explanatory or exploratory sequential designs' or ' embedded design' (Tashakkori and Teddlie, 2003; Creswell and Plano Clark, 2011) may also be fruitfully employed within this highly complex research field because they help the researcher to better incorporate multiple viewpoints, perspectives, positions and standpoints.

With regard to the issue of sampling, it can be seen that some applied sampling selection methods (e.g. researching the employees of an organisation as in Diaz *et al*., 2012 or researching students of a faculty as in Adeoye *et al*., 2010) are effective from a financial perspective but can result in limits being placed on generalisation. Some selection criteria [e.g. family type (Currie and Eveline, 2010) or job (Hislop and Axtell, 2011)] can have greater explanatory power and information content, but these studies neglect significant masses of people who are also affected by phenomenon under investigation. Mobile phone use-related WLB research has the potential to be further expanded and developed for currently under-researched populations (e.g. to employees who have no children but have other dependent family members or to lower skilled and manual workers). In the future, it may also be fruitful to investigate how job characteristics [e.g. job autonomy (Maume *et al*., 2009), employment status, security or other communication-related specificities, working hours, work stress, etc.) can affect the role of mobile use in creating the WLB, or whether a job-based typology can be established. For example, ICT may have quite different effects on the WLB even within the same company in the cases of office workers who have fixed working hours but can use ICTs flexibly, help desk workers who cannot use ICTs for private purposes during working hours or with sales representatives who have flexible working hours but who need to be away from their families a lot. It is overly reductive to only examine managerial or non-managerial groups in different industries or to focus on specific job types like mobile workers or freelancers. It would also be interesting to undertake cross-cultural or cross-generational studies. Because current research focuses on families with small children, older age groups who have different situations and different ICT use practices are usually omitted from literature; these populations are ripe for researching. Gender comparisons, on the other hand, are quite common in the literature. However, the emphasis is on women, which indicates that the situation of the relationship of ICT to men/fathers is also under-researched. There is also a room for longitudinal research that can unveil the dynamics of WLB–ICT interrelation.

Finally, it can be concluded that just as the applied theoretical frameworks and methodologies prove to be diverse, findings are likewise incongruent. The use of ICTs (including mobile telephony) can both hinder and facilitate the WLB and affect life domains differently. ICTs support negative work-to-family spillover (Tennakoon, 2007); however, other factors such as age, family type and job characteristics can have greater influence (Wajcman *et al*., 2008) on mobile usage. ICT is indeed acting to blur the boundaries between work and family (Chesley, 2005), but it can also support individuals to create strict demarcation lines (Wajcman *et al*., 2008). Empirical research shows that ICT use can contribute to dissatisfaction with life in general and with family life (Valenduc and Vendramin, 2002; Chesley, 2005; Leung, 2011), but on the other hand ICT can increase job satisfaction (Diaz *et al*., 2012). Advantages that appear in the domain of work can require sacrifices in private life, and this can contribute to the conflict between the two life domains and create the feeling of job burnout (Leung, 2011). However, throughout the whole process, individuals' decisions play an important role. Mobile telephony and ICTs may be seen as a double-edged sword from the perspective of WLB. Individuals can create their own strategies to manage boundaries,

their flexibility and permeability; however, their decision-making scope is limited. The nature of these limits (e.g. norms, labour market trends, corporate policies, etc.) will be subjects for later research.

Notes

1. Other theories also arise in the WLB–ICT literature, for example, conflict theory as applied by Sayah (2013).
2. Research by Currie and Eveline (2010) is a counterexample. The authors employed an explanatory sequential mixed methods design and followed up their online survey with in-depth interviews and time diaries.

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