The status of research on teleworking and an agenda for future research

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Teleworking is a relatively new mode of alternative work arrangements. During its short life, the study of teleworking gained considerable attention in the literature for both its academic relevance and its practical implications for management. This paper provides a comprehensive review of the developments in this area, studying the nature of teleworking, its antecedents, processes and outcomes. Different models and perspectives are presented and analysed with emphasis shared between both positive and negative aspects. Directions for future research on teleworking issues, as well as recommendations for a new research agenda, are offered within a framework of *Why*, *What* and *How* to explore the future of teleworking.

The aim of this paper is to review the literature on teleworking, focusing on both its positive impact as well as its possible pitfalls. In light of recent development in the study of teleworking, an agenda for future research is set. Teleworking is a managerial practice in the stage of infancy, and as a result its study is just developing (Kurland and Egan 1999). It is part of the wider phenomenon of flexibility in the workplace, deemed a crucial element in managing people in today's fast changing environment.

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Teleworking: Origin and Definition

Teleworking is an alternative mode of work, enabled by technological improvements and increase in use of information technology (IT) on the one hand, and on the other hand, by an unconventional managerial approach, which takes it that work is what you do, not a place where you go (Davenport and Pearlson 1998). During the 1950s, the literature on technological new inventions in electronics and communication systems led to the idea that telecommunications, combined with computing technology, could enable work to be relocated away from the traditional office (Jones 1957, 1958). Toffler (1980) suggested that the information age ''could shift literally millions of jobs out of the factories and offices into which the Industrial Revolution swept them right back to where they came from originally: the home''. Widespread interest in

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teleworking started in the 1970s, when the term 'teleworking' was coined to encapsulate remote working from the office (Nilles *et al.* 1976). Teleworking was expected to be the ''next workplace revolution'' in the 1980s (Kelly 1985), and interest continued to grow in the 1990s among employees, employers, transportation planners, communities, the telecommunications industry and many others (Handy and Mokhtarian 1996). It is also suggested that, with the effective use of teleworking, the 'virtual organization' may be the next stage in organizational development (Chesbrough and Teece 1996; Davidow and Malone 1992; Handy 1995; Peiperl and Baruch 1997).

Although teleworking has been discussed for some years, a universal definition is still not in place (IRS 1996; Moon and Stanworth 1997). There is not even an agreed term: 'teleworking' (common in European literature), 'telecommuting' (common in American literature), 'home-working', 'working-at-a-distance', 'off-site workers', or 'remote-workers' – all these terms may have similar meanings and are used exchangeably. However, this terminology tends to cover a variety of different working practices which can overlap owing to differences in the definition (Lamond *et al.* 1997; Huws *et al.* 1990). Indeed, Qvortrup (1998) refers to the problems and ambiguity of the definitions [see also Felstead (1996) for further discussion on the definition of home-working]. The lack of a universally accepted definition of teleworking causes problems: for example, academically it hinders the ability to compare findings from different sources. From the legal perspective, the lack of an accepted definition causes contractual uncertainty (Smith and Baruch 2001). It also makes it almost impossible to find out how many people and organizations practice teleworking.

A number of attempts have been made to define teleworking (Cross and Raizman 1986; Grant 1985; Gray *et al.* 1993; Kelly 1985; Olson 1988; Shamir and Salomon 1985). Huws *et al.* (1990) argued: ''Teleworking could take the form of working from home some or all of the time; working while on the move, working from a remotely sited office etc. But it is a mistake to regard it as any single, fixed form of employment.'' The common denominator for most definitions is, first, that the office is not the (only) place where work can be conducted, and secondly, that IT is the vehicle allowing this to happen, i.e. teleworking uses electronic media as its main 'tool' (Mitchell 1995; Negroponte 1995). The latter distinguishes between human-capital-based employment, and the manual home sweatshops, the 'rug-industry' that still exists extensively in certain sectors (Felstead and Jewson 2000). Following the wide range of terminology mentioned above, a straightforward definition (which similarly to others excludes self-employment and manual-based home production) can be:

> Teleworking occurs when employees perform all or a substantial part of their work physically separated from the location of their employer, using IT for operation and communication.

How Common Is Teleworking?

Futurists such as Alvin Toffler (1980) and Handy (1984) have predicted that teleworking will form a new pattern of employment, and surely the phenomenon is spreading steadily. It was suggested that, by 1995, about 50% of employees and 43% of the self-employed could work from home, through innovative arrangements made possible by IT developments (Olson and Primps 1984; Rothwell 1989). Already in 1971, American Telegraph and Telephone predicted that *all* Americans would be working at home by 1990 (Craipeau and Marot 1984). According to a more humble forecast by the USA Department of Transportation, the penetration of teleworking in some form or another could result in between 5.2% and 10.4% of the total US workforce by 2000, up from an estimated 1.6% in 1992 (DOT 1993). Barnes (1994) predicted 20 million by 2000. Actual figures from early

1990s suggest numbers between three and nine million people in the US who work at least one or two days per month (Piskurich 1996; Weiss 1994). The US figure for 1997 is 11 million (cited by McCune 1998; Scott and Timmerman 1999), which is triple the number in 1990 (McCune 1998). In Europe, the Henley Centre for Forecasting suggested that over four million people in the UK could become teleworkers by the mid-1990s and that, by the beginning of the next century, an actual figure of a third of the total working population could be teleworkers (Stanworth and Stanworth 1989). Huws (1993 1996) found that 12% of UK employers were using some home-based workers, with 5.8% using teleworkers. In Australia, the percentage of employees who agree with their employers on teleworking feasibility is 4% (Australian Bureau of Statistics 2000). It is most probable that geography has an impact. Evidence from Europe showed that less than 1% of employers are using teleworking (Brewster *et al*. 1994). A higher estimate is suggested by Tregaskis (2000), who indicates that some 8% of employed people telework, with strong variations among nations even within Europe. All in all, it is clear that teleworking has not lived up to the anticipated level of its expansion.

Previous Studies on Teleworking

The study of the teleworking phenomenon is still fairly new (Hamilton 1987; Licht 1988), and as such is of great interest to researchers both in theoretical issues (Metzger and Von Glinow 1988; Skyrme 1994) and empirical research (Huws 1993; Yap and Tng 1990). Some scholars discussed problems associated with information technology and its capabilities when adopting teleworking (Gupta *et al*. 2000; Stanworth 1998). Indeed, hardware and software IT developments have made it feasible to make teleworking much easier and more practical (cf. Mueller 1992). Fast modems, ISDN (Integrated Services Digital Network) systems, new generations

of personal computers and laptops, and similar technology, coupled with a significant reduction in the cost of equipment, and in particular, the decreasing cost of use of telecommunication, paved the way for the widespread utilization of teleworking (Watad and DiSanzo 2000). On the other hand, the further congestion of roads and the use of laws to discourage private use of transportation provided teleworking support from a different angle, that of a need to improve life in rural areas. However, these refer to the physical aspects only. The real, deeper hindrances lie within humans and organizations. Less focus was put on attitudinal analysis of the teleworkers themselves and their employers. Factors such as culture, organizational needs, or personal situation which may influence these attitudes are yet to be studied further.

There are a growing number of studies taking into account the perspective of the employers (Caudron 1992; Huws 1993; Mahfood 1992) or the impact on work organizations (Olson 1981; Piskurich 1998). Fewer have been concerned with possible improvements in effectiveness (for exceptions, see Baruch 2000; Di Martino and Wirth 1990) or in suggesting teleworking as a strategic option (Skyrme 1994). Some have mentioned trade union responses to teleworking or implications for legislation (Bibby 1996; Horner and Day 1995; Vega-Ruiz 1992). Government planning and impact on environmental and social issues have also been discussed only briefly (Handy and Mokhtarian 1995; Marcus 1995).

Why should we draw increasing attention to the study of teleworking? Several reasons are already accepted and acknowledged. Teleworking is well recognized as an 'alternative mode of work' or 'flexible work arrangements' (Drucker 1999; Gottlieb *et al*. 1998; Peiperl and Baruch 1997). It is topical, and many people in both popular media and academia study and report on it frequently. Teleworking is an innovative concept, and the time has come for rigorous study of it and its associated phenomena.

Most of the early writing on teleworking was focused on its innovative and positive influence (or expected impact). Some can be depicted as a 'Gloria song' for Teleworking (e.g. Cairncross 1997; Mahfood 1992). Recent views are more balanced. Studies from the late 1990s (Baruch and Nicholson 1997; Davenport and Pearlson 1998; Hill *et al*. 1998) provide balanced reports, which open questions about the idea of 'best way' or suitability of teleworking to 'all'. Davenport and Pearlson studied 100 of Fortune 500 companies to find out that less than 30% of these leading companies apply alternative work arrangements, and, when it comes to teleworking, it is just about 10% of the employees who are 'mobile' at some time. Moreover, of those companies which do not have such programmes, only 15% are considering this option. It may be that the intensity of successful application of teleworking is reaching its optimal level.

Theoretical Frameworks

The phenomenon of teleworking can and should be studied from a variety of theoretical perspectives and frameworks. It is concerned, for example, with the theory of careers, but as Arthur *et al*. (1989) have indicated, the concept of a career is not the property of any one theoretical or disciplinary view. They presented eight viewpoints on the career concept (psychology, social psychology, sociology, anthropology, economics, political science, history and geography); all are also relevant to the study of teleworking, with the additional organizational theory, and the unique and crucial perspective of engineering or information technology and management.

Theoretical Contributions

Not all scholarly work praises teleworking. Metzger and Von Glinow (1988) were some of the first to provide a balanced view, with specific focus on the difficulties expected as a result of this mode of work. They identified six main problems associated with teleworking: (a) control mechanisms for effective governance and direction; (b) scarcity of non-financial incentives; (c) career progression options; (d) social isolation; (e) the presence of children; and (f) loyalty and commitment. Further studies provide support for some but not all of these: Several scholars identified social isolation (cf. Davenport and Pearlson 1998; Gainey *et al*. 1999), whereas Bains's (1999) findings contradict this common tendency by showing the benefits of networking and an indication that teleworking does not necessarily mean isolation. Baruch (2000) had mixed results relating to the influence of children – their presence was negatively regarded by those with no children at home, but was not considered an obstacle by those with children.

The best output comes from teleworking if it is done on a part-time basis (Baruch and Nicholson 1997; Goodrich 1990). Teleworking on a part-time basis can prevent or significantly reduce the social isolation of teleworkers.

Venkatesh and Vitalari (1992) placed teleworking within the wider context of decentralized organizational structure. They refer to supplemental work done at home, in addition to the conventional office-based work. This type of arrangement can be merely finishing residual work roles at home either later in the day or during weekends, but this can develop to home-based work, which fit teleworking patterns. In some cases, this can be the trigger to the transition from fully office-based to part-time teleworking, in cases where the completion of the supplemental work at home proved effective. The main contribution of Venkatesh and Vitalari's model is bringing together the three factors of (a) organization/work factor, (b) the technology factor, and (c) the household factor (the latter comprises both household as well as demographics), referring to home–work relations.

At the practical level, the management of teleworking can be associated with the 'management of diversity' framework, and at

the strategic level, with the growing need for flexibility under human resource management (HRM). The management of diversity need not be restricted to different approaches and programmes for women, ethnic minorities or the disabled. In its deeper sense, diversity is the management of different needs and different modes of work, and teleworking forms a significant role in enabling effective management of diversity in both aspects (groups with special needs, as well as people who can get the best output utilizing a variety of operational modes). Taken to the strategic level, teleworking should be part of general strategic management, as Farrah and Dagen (1993) and Skyrme (1994) argued. This notion fits well with contemporary calls for greater alignment between HRM and the business strategy (Gratton *et al.* 1999; Holbeche 1999).

Antecedents to Teleworking

The two most significant antecedents to teleworking are the technology involved and the people. The technology, as mentioned above, is the physical enabler and is highly developed, even though there is still room for innovations (Pliskin 1998).

As for the human side, one of the most important aspects is people's willingness or readiness to telework. In an examination of the inclination to opt for teleworking, the framework of Ajzen and Fishbein (1980) would be relevant. Their model ascertains that attitudes, values and norms are antecedents to intentions or inclinations, which in turn, generate actions (Ajzen and Fishbein 1980; Fishbein and Ajzen 1975). In addition, attitudes, values and norms are affected by individual personality (and demography) as well as by environment, mostly the prevailing culture. Fishbein and Ajzen's theory of planned action can serve to explain the question of 'why', as was done in the past for other concepts.

However, to enable effective teleworking, the intention needs to come from both employees and employers. Managerial reactions

to the idea and the associated communication behaviours to reinforce these reactions will impact people's decision-making re teleworking (Reinsch 1999). As mentioned before, early prediction put a figure of 50% of the workforce as the future level. A more humble estimation would follow a realistic approach as offered by Baruch and Nicholson (1997). They claim that there are four factors, with certain conditions which need to be fulfilled before teleworking can become feasible and effective (see Figure 1). The four factors need to be present simultaneously to enable effective teleworking. These are:

(1) the job – the nature of work and fit of technology for the specific work-role
(2) the organization – how supportive is the business culture to home-working arrangements, including the willingness and ability of workplace-based management to trust teleworkers
(3) the home/work interface – covering a diverse range of factors from the quality of family relations to the kind of physical space and facilities available
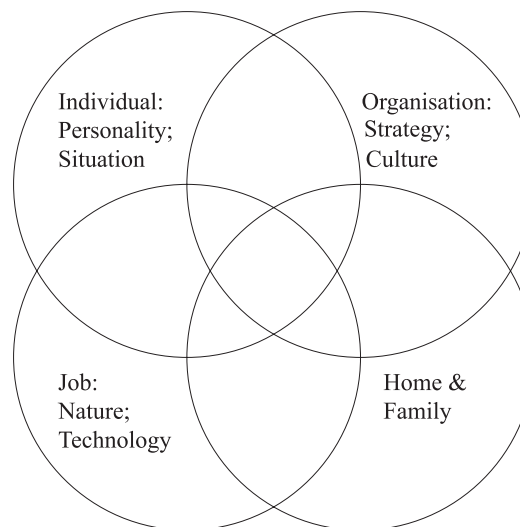

Figure 1. Baruch and Nigel's four factors of teleworking. From Baruch, Y. and Nicholson, N. (1997). Home, sweet work: requirements for effective home-working. *Journal of General Management*, 23(2), 15–30.

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(4) the individual – fit of teleworking with personal attitude, values, norms, qualities and needs

Since *all* these factors are essential, it is unlikely that teleworking will reach a very high level of application in the foreseeable future. It seems that only a strong external input, for example the possible catastrophic option of energy or transportation crisis (e.g. ending of fuel reserves with no alternatives in the near future), can cause teleworking to accelerate.

Processes of Teleworking

Nature of Relationship between the Individual and the Organization

Kurland and Egan (1999) studied the perception of organizational justice from teleworkers' viewpoint. Trust in general and perceived organizational justice was found to be an important aspect in making room for teleworking. It fits in with the notion of both distributive justice and procedural justice, as both are needed to make the operation of teleworking a success.

Issues of control and motivation would be different for teleworkers. With no direct monitoring, both should be results related. Managers might find it hard to adjust to such a different system (Harrington 1999). In such an environment, performance-related pay can be useful, as long as clear targets can be set for the teleworkers. This may prove complicated for cerebral work, while quite easy for more repetitive, customized work (e.g. telesales roles).

The perils of counting on computer-mediated technology only are concerned with the limitations and even dangers of supreme reliance on IT for communication (Baruch 2001). Even advocates of the use of computer-mediated communication such as Culnan and Markus (1987), who suggested that electronic media have capabilities and functions not found in face-to-face communication,

acknowledge that communication mediated by technology filters out communication cues and will change both intrapersonal and inter-personal variables. One possible danger is misuse or abuse of the communication system such as for uninhibited communication in the absence of familiar social context (Sproull and Kiesler 1986).

These problems might hinder the creation and development of virtual teams, and thus result in the possible pitfall of loss of teamwork benefits due to teleworking.

Outcomes of Teleworking

The actual and possible outcomes of teleworking will be discussed at several levels, as summarized in Table 1. Note that ''more time with the family'' was inserted in both positive and negative columns: For many, being able to spend more time with families can be a blessing, whereas for those who use work as sanctuary from the home and its related hardships (Hochschild 1997), the opposite may be true. This is another indication that teleworking can reach its best output when it is organized on a voluntary base.

Outcomes – Organizational Effectiveness and Cost-savings

Recent evidence continues to indicate the positive consequences of teleworking to employers (Jackson and van der Wielen 1998; MITEL 1998). Some advantages are quite tangible, such as cost savings in office space. These are the most apparent and clear advantages. People who telework do not use office space and do not create overheads. Even in case of part-time teleworking hot-desking can generate space savings. Others benefits are less tangible, but no less important. In particular, improved efficiency and employees' effectiveness is well documented, as found in several studies based mostly on self-perceptions (e.g. Baruch and Nicholson 1997; Hill *et al.* 1998; Leonard 2000). Others, such as morale or satisfaction, are intangible.

Table 1. Possible benefits and shortcomings of teleworking (Adapted and developed from Baruch 2000)

Level	Possible benefits	Possible shortcomings and challenges
Individual	• improved performance/higher productivity • less time spent on commuting • satisfying need for autonomy • improved quality of working life (e.g. working environment) • less work-related stress • more time with the family • could be the only way to work at all (mothers of infants, disabled, etc.)	• less opportunities for affiliation, detachment from social interactions • less influence over people and events at workplace • questionable job security and status • fewer career development options • lower 'visibility'/promotability • work-related use of private space and resources • more home-related stress • management of work–home interface without time/space buffers • more time with the family
Organizational	• higher productivity • wider labour market to draw upon • space and overheads savings • less absenteeism • image of a flexible workplace • legal requirements	• control over teleworkers' activities and monitoring performance • control over health and safety • need for alternative motivation mechanisms • less committed employees • loss of team-working benefits
National	• less commuting, less pollution, congestion, accidents • support for local, in particular rural, communities • more people can work • less discrimination	• the creation of an autistic society (i.e. individuals atomized and isolated from social institutions) • need to adapt legal system

Legal requirements such as the US Clean Air Act and the American with Disabilities Act have implications for teleworking, either directly or indirectly. Teleworking will be required or encouraged to comply with such legislation, and it is expected that further legal interventions would follow suit. One example for the interference of legal requirements and organizational control mechanisms is the employee privacy rights (Dombrow 1998; Fairweather 1999). Many countries follow the US in the trend of becoming a litigious society, and teleworking as a legal require-ment might be imposed on organizations, particularly in very dense populations. This would serve as an additional incentive for teleworking at the organizational level.

At both national and human levels, teleworking can help in harmonizing the rela-tionship between people and the environment, and in particular with the local community. One activity that is difficult to employ in the office environment is thinking. Baruch and Nicholson (1997) found that interruptions and disruptions were crucial factors indicated by teleworkers as prohibiting effectiveness in the traditional office. As one of their interviewees said: ''When I want to work I go home.'' Several studies found a positive impact of teleworking on individual performance, well-being and effectiveness (Atkinson 1985; Baruch, 2000; Di Martino and Wirth 1990), although evidence for improved performance is mostly based on self-reported evaluations.

Negative impact of teleworking. Chapman *et al*.

(1995) claim that negative experiences that might be caused by teleworking fail to materialize, either because they are far outweighed by the benefits, or because individual teleworkers may be self-selecting. If teleworking is forced on employees, the results may not be so positive. However, certain negative aspects were mentioned in past studies.

Social Isolation and Communication Problems

Social isolation was acknowledged by most scholars as the most significant potential or actual aspect of teleworking. Others suggested that e-mail, teleconferencing, phone and other means of updated communication will successfully replace the traditional face-to-face interface. This perspective was confronted by Peiperl and Baruch (1997), who warned that

> One view is that the society that results from these new ways of working may be severely disabled when it comes to interpersonal communication: an 'autistic society,' in which we become unaccustomed to dealing with others except in purely transactional ways; a global village of poor communicators.

See further for Baruch's (2001) notion of the autistic society.

In this respect, there is a significant difference between partial teleworking and full-time teleworking. Part time occurs when teleworking is applied, either in a consistent or random pattern for part of the time (for example, 1–4 days a week). The social isolation problems would be more acute in full-time teleworking (Huws 1993). Another distinction with specific relevance here is between the mobile teleworker such as the sales-person who meets customers on a daily basis, and the home-worker, confined to his/her work-station.

Part-time teleworking can provide a good balance for people who, on the one hand, need the quite atmosphere of home, and on the other hand still wish to keep the personal relationship with their colleagues at the office. This, however, can occur in a traditional setting, when a few of the employees telework for part of the time, and still keep their office place and individual facilities for use while in office. In other contemporary settings, such as the 'hot-desking', people no longer 'own a territory' in 'their' office, and when going to the headquarters for meetings, for example, a specific space would be designated on a continuous motion base.

Baruch (2001) discussed the autistic society phenomenon, and argued for moving the attention of studies from emphasis on the advantages of computerized communication to the pitfall of creating a society in which people are detached from each other, and have severe difficulties in developing 'conventional' communication. This phenomenon is not one-sided, since positive IT impacts were identified too: Lee (1994) focused his work on the richness of computer-mediated communication, while Nohria and Eccles (1992) argue that when organizational electronic mail interaction increases, face-to-face interaction must also increase, though not to the same extent. This, they claim, is needed for robust and effective organizational performance

Promotability and Career Prospects

Teleworkers, perhaps due to the isolation, may feel that 'out of sight is out of mind' when it comes to promotional decision making. This means that career aspirations of teleworkers would tend to be lower than the career aspirations of their counterparts (Baruch 2000). PATRA (1992–1994, cited by Chapman *et al.* 1995) report such feeling (see also Ramsover 1985). These perceptions may be due to the employment status of the teleworkers (also see Stanworth 1998).

Health Impact

Teleworking is strongly concerned with all of the six stressors identified by Cooper *et al.* (1988). These include: (i) factors intrinsic to

the job (working conditions, hours worked, travel, new technology, work overload/ underload, responsibility, autonomy); (ii) role in the organization (role ambiguity, role conflict); (iii) relationships at work (clients, peers, supervisors, amount of support given); (iv) career development (job insecurity, CPD, appraisal systems and performance measurement); (v) organizational structure and climate (power and politics in organizations, competition, marketplace); (vi) home–work interface (dual career couples, financial considerations). Major organizational change, such as corporate restructuring is likely to impact on all these areas, possibly simultaneously. The self-perception of teleworkers was that they suffer less work-related stress, but more family-related stress (Baruch and Nicholson 1997). Their findings fit with Lewis and Cooper's (1995) and Standen's (2000) idea of the spillover between work and family that occurs in teleworking practice.

In direct association with the health state of teleworkers, Steward (1997, 1999) recognizes an interesting phenomenon – while teleworkers rarely reported being 'off sick', many were working while not being in proper health conditions. Working from home put specific pressure on employees to work under most conditions. For the traditional office worker, taking a day or two off for health may serve as a 'safety-valve' which enables them to feel okay if they do not work for genuine or apparent illness. This 'privilege' is withdrawn from the teleworkers.

Other Typical Problems

Control mechanisms. Traditional control mechanisms are based on direct supervision and opportunity for observation. Managers fear that they lose control over teleworkers as the latter gain autonomy through teleworking (Kugelmass 1995; Kurland and Egan 1999; Tomaskovic-Devey and Risman 1993). Control mechanisms which are appropriate for teleworking' situations are not necessarily similar to those fit for conventional operations (Cooper *et al.* 2000). In their study, Cooper *et al*. identified that managers used a combination of new technology-based behaviour controls (e.g. audio conference meetings), and planned traditional face-to-face meetings.

It is clear that the base for controlling (and measurement or output) for teleworkers should be a results-based orientation and a culture of trust. When people are judged according to their actual output, it should not matter where or when they accomplished their targets. Research and development (e.g. academic work) comes to mind in this respect. If a researcher's output is publications, the idea, the data collection or the writing up can be done from the office, home or elsewhere, and there is no efficiency advantage for the office. In this sense, teleworking requires both employees and employers to reassess their psychological contract (Sparrow 2000).

Sectorial differentiation. It seems that we can have a crude distinction among three types of industrial sectors or professions: One group comprises those that fit well for teleworking. For them, if the personal and cultural issues are submissive, teleworking can be applied successfully. An example is the media (Bains 1999). The other extreme includes sectors or professions where it looks like there is no room for teleworking in the foreseeable future (e.g. in jobs that require physical presence). In-between, these groups, there are sectors and professions for which partial fit exists, sometimes subject to the availability of the right technology. Further technological developments will enable more occupations to enter the realm of teleworking.

The Virtuous Cycle versus the Vicious Cycle of Teleworking

While most of the literature on teleworking focuses on the positive aspects of the process and its outcomes, it was pointed out above that applying teleworking does not necessarily guarantee success, and certain negative outcomes might result from teleworking. Such

outcomes reinforce both the positive ones in a virtuous cycle, and the negative ones in the vicious cycle. Figure 2 represents a system approach for teleworking processes.

Setting Agenda for Future Research on Teleworking

This final part of the paper will look at the future, suggesting teleworking-related aspects and issues that the academic community should put under scrutiny. Attention is given to the type of research methods appropriate for these future directions.

Using the system approach, research may focus on: antecedents and preconditions for teleworking, for example, feasibility or inclinations to opt for teleworking (cf. Baruch and Yuen 2001); the processes involved in the management of teleworking (e.g. motivation, communication) and the outcomes of teleworking (at different levels: individuals, families, organizations, society). The four factors model of Baruch and Nicholson (1997) offers a promising starting point for such future studies. Each of these factors or combination of them, justifies comprehensive enquiry. Such research may focus on the theoretical underpinning of these factors, and also their implementation (such as preparing the organization for teleworking, selecting the people, developing teleworkers' careers, etc.).

Research Method

Similarly to other methodologies applied to studying people at work, the study of teleworking can use much of the existing methods. Some will have to be adapted, such as the way questionnaires are distributed. If interviews are needed, the teleworking
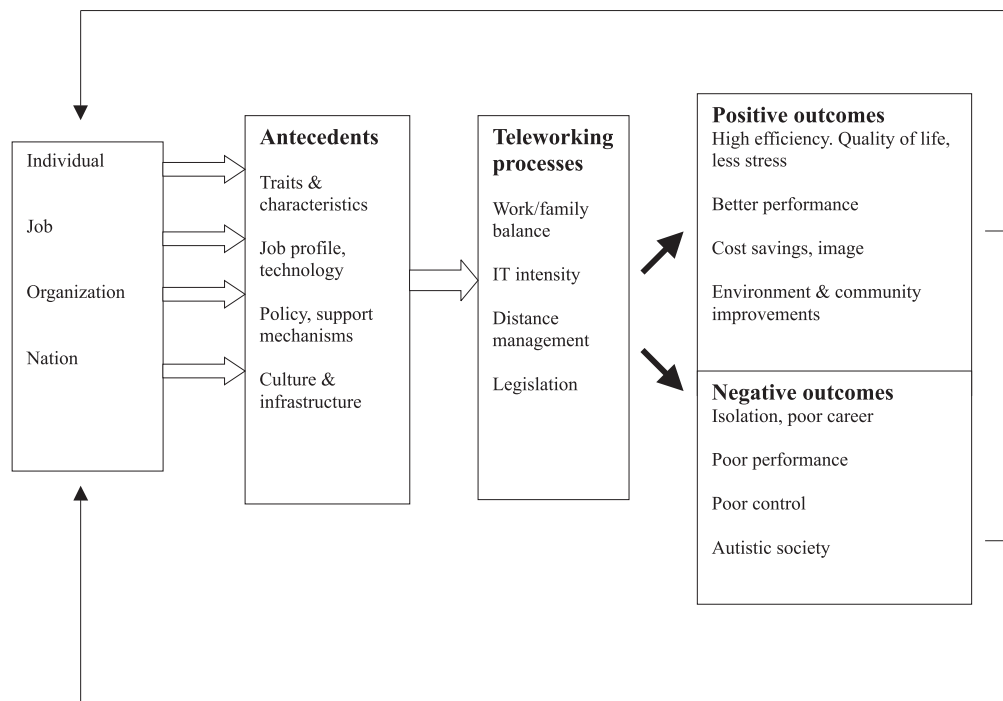
Figure 2. The virtuous versus the vicious cycle of teleworking. Comment: only one example is inserted in each box, according to the four levels, for demonstration purpose.

environment might mean more time and budget are needed for travelling. Questionnaire surveys may alternatively be sent by mail or by e-mail, phone interviews – in particular when camera-phone is more common, may substitute face-to-face interviews. It would be more difficult to get permission for direct observation-based research (privacy matters). Other methods will be available similar to those utilized in conventional studies. These can be action research, ethnography, documents analysis, field study or event history (e.g. critical incident analysis). Pre/post-teleworking experience or longitudinal studies are expected to yield the most significant results.

Population

As implied from the above, the population of such future studies at the individual level may consist not only of teleworkers. Much can be gained by comparing studies of teleworkers with those of others (for example, re productivity). At the individual level, studies can look at the type or kind of people for whom teleworking may work well (career stage, desired qualities, skills, traits, competencies, characteristics, etc. can be relevant factors). Family and relationship issues can be put under scrutiny, as well as environmental aspects that may either support or negate teleworking. At the organizational level, studies can focus on organizational intervention, management practices for control, the management of trust, and in particular, organizational culture (which may range from supportive, submissive, indifferent, objecting, to rejecting cultures). With clear indications for jealousy among non-teleworkers of their teleworking colleagues, the organizational justice perspective, i.e. procedural, and distributive justice could highlight the difficulties in creating and maintaining a coherent and cohesive workforce when teleworking adds to the diversity.

A completely different stream of future research can touch on the technology component, and the type of developments that can help in adding more professions and business sectors to the era of teleworking. Analysis of emerging technologies can be a good starting point for such a flow. Issues worth studying may concern jobs, roles and professions for which teleworking is feasible now, may be feasible in the near future, the far future, and those which may never be relevant for teleworking status.

Methodology

Many of the studies published to date were conducted at one point in time. In the future, and as the phenomenon is established, more will be expected in the form of longitudinal studies. In particular, existing knowledge would benefit from a 'before versus after' type of investigation, for example, to study the impact on performance, health or turnover. Further understanding of teleworking may be achieved via the use of images and metaphors (e.g. symbiotic interaction), and stereotypes of teleworking in compliance with actual findings, to compare rhetoric versus reality, as suggested by Legge (1995).

Human Resource Management Issues: Selection and Career Management

Other studies can focus on applying different HRM practices, in particular, the selection of people for teleworking: internal selection to point out who should telework; external selection – who should be recruited for teleworking roles. Another HRM area is career management and performance appraisal: Thomas (1999) has indicated that there is a need for different performance appraisal systems to fit teleworking. Teleworking is usually initiated, managed and co-ordinated via human HRM. The HR manager can take the lead role in introducing and maintaining the practice of teleworking and, in any event, would be involved in setting the managerial infrastructure (but not the technology), and in particular in monitoring and keeping track of developments.

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Examination of the meaning and the impact of teleworking for the individual worker requires relating to a variety of aspects. Baruch (2000a) expects effects of five kinds:

- *identity* – changed conceptions of one's self as an employee, family member, career aspirant
- *skills* – development or atrophy of skills, including social and time management skills
- *context* – changed awareness of communications, distractions, use of time and space
- *role demands* – changed priorities, demands, constraints and supports in relation to elements of tasks and relationships
- *role outcomes* – changed attitudes and satisfactions, felt stress, performance and material rewards/costs

Omari and Standen (2000, 114) offer a framework for selection for teleworking, which consists of the following variables: organizational environment, type of telework, the teleworker, remote environment and task characteristics. What kind of psychometric tests can be utilized to make a choice? Chapman *et al*. (1995) argue that the selection criteria for teleworkers should not be different substantially from those for on-site staff, but recognize they will need to have focus on self-management skills. A different issue is whether the assessment should be based on subjective or traditional-objective evaluation or both. What is clear is that any assessment should be based on valid and reliable assessment tools. Theoretical frameworks such as the psychological inventories of 16PF (as a traditional one) or The Big Five (introduced to the literature of personality and careers by Goldberg 1990) could be useful in this respect. Their implications for practice in both psychology and HRM start to receive wide attention (Mount and Barrick 1995). In addition, the competencies approach can serve as a relevant theoretical framework. However, psychometric analysis would not be sufficient

for the selection. If combined with a set of self-selection, managerial selection and peer selection, the outcomes are expected to be better, and the choice of selection and its outcomes need empirical investigation. Selection should not be restricted to the teleworkers only, but also to their managers (Guimaraes and Dallow 1999).

Performance

From a managerial perspective, two issues would attract high priority: First, the impact on performance and effectiveness and, secondly, how to measure the performance. This relates to the question of appropriate control mechanisms. Another interesting issue to study would be the appropriateness of performance-related pay in the virtual environment. The development of effective performance appraisal to fit teleworkers is expected to be different from conventional systems (Thomas 1999).

Additional Theoretical Frameworks to be Included in the Study of Teleworking

The study of teleworking mostly lies within the behavioural and management sciences. Teleworking provides a wide base for studies in these areas, be they sociology or psychology related. At the society level, it may be explored as a social experimentation. At the individual level, a variety of research topics can emerge, such as the perception of work and the boundaries between work and non-work realms: Do I think I am working when I am not? This may direct attention to the question of the nature of the psychological contract that exists between the conventional employee and the teleworker (Rousseau 1995; Sparrow 2000). At the organizational level, the concern would be more on processes and outcomes in terms of effectiveness.

HRM covers other managerial aspects, and especially the career theory: teleworking can form part of people careers. Career issues will influence the transition to teleworking and

will have an influence on career outcomes. Such a question would be which career stage (e.g. Plateau) would best fit teleworking?

Quite a different view, but one that may attract considerable attention is gender studies, i.e. males versus females comparative studies (e.g. role or status of women as relegated to teleworking). Most studies can either focus on this topic or add it as an additional perspective.

The study of virtual organizations is in its infancy, and teleworking resembles to a certain extent the virtual organization. Much needs to be known, for example, of team building, how might social relationships develop, emergent leadership in virtual teams, to mention just few.

The managerial view would focus on the practices and, here, issues of importance may be:

- how teleworkers manage their work – time, space structure, set up links
- influence of teleworking on social capital
- networks – what is the right mix for any given person and situation
- employment relations (telework is not a highly unionized sector)
- the question of balance: when too much teleworking is too much? Or what is the best ratio between office located and remote location and how this could be measured?
- teleworking impact on loyalty/alignment of individual/organization goals? Generally or compared to devotion for self-determined goals?
- processes: communication – types/frequency/content of communication; leadership managerial control, emergent leadership, succession planning; decision-making in virtual teams; motivation of teleworkers and of conventional employees who work closely with them
- 'Hallway Work' (e.g. informal co-ordination, culture, building etc.) – the negative impacts of losing these aspects was highlighted by Davenport and Pearlson (1998) but needs further demonstration via in-depth study
- control mechanisms and their effectiveness for the management of teleworkers will close the list of organization-related aspects. The type of jobs involved can be the moderator for the teleworking outcomes. Another possible moderator is the level of the teleworking in the hierarchy, and particularly the participation of top management.

Apart from individual and work-related aspects, the home–family interface should be subject to much more study than conventional work arrangements, since teleworking is interwoven with home life (see Near *et al.* 1980). Among the issues to be studied are the enablers for teleworking within the family framework, as well as the family impact questions, for example, the impact of teleworking on child development and children's career choices. These can be explored, either via longitudinal studies or by testing in 20–30 years' time. The outcomes of parental involvement can serve to encourage more parents of both genders to telework or, if negative, discourage them from doing so. In this context, it would be interesting to look at the cultural assumptions about segregation between work/family issues.

Final note

Teleworking is a new phenomenon. Much has already been done, in particular on its positive outcomes, but it is necessary to study teleworking further in order to avoid pitfalls and reap the benefits for individuals, families, organizations and society as a whole.

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