Permeability between Work and Non-Work: The Case of Self-Employed IT Workers

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Abstract: This research deals with the spatial and temporal permeability of borders between work and non-work for self-employed IT workers. Permeability embodies the shift of working spaces and times initiated by new information and communication technologies. Self-employed IT workers are an interesting population, because they combine work independence with an intense use of new technologies. First we present their practices in terms of spatial and temporal permeability between work and non-work. Our results then lead to the identification of two groups: integrators, who prefer to intertwine work and private life, and separators, who prefer distinct segmentation and little interference between work and their private life. Our results also indicate that permeability is correlated to job characteristics and to individual characteristics such as gender and the presence of young children.

Keywords: Self-employed IT; Work; Permeability of work and non-work

Résumé : Cette recherche s’intéresse à la perméabilité spatiale et temporelle des frontières entre le travail et le hors travail chez les travailleurs autonomes de l’informatique. Cette perméabilité participe de la recomposition des lieux et des temps de travail, permise par les nouvelles technologies de l’information et de la communication. Les travailleurs autonomes de l’informatique forment une population intéressante car ils combinent travail indépendant et utilisation intense des nouvelles technologies. Après un état des lieux de la perméabilité spatiale et temporelle du travail, deux groupes émergent : les « intégrateurs » mélangent fortement le travail et les activités personnelles tandis que les « séparateurs » préfèrent une segmentation des activités et peu d’interférences entre le travail et le hors travail. Nos résultats montrent que la perméabilité est corrélée aux caractéristiques du travail mais aussi à des caractéristiques individuelles telles le genre ou la présence de jeunes enfants.

Mots clés : Travailleur autonome; Technologies de l’information; Travail; Perméabilité, entre travail et hors travail

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Introduction

Today a set of factors is questioning the traditional organization of working times and spaces. The development and generalization of new information and communication technologies (ICTs) comes first to the list of factors. Self-employed workers in the information technologies (IT) sector form a category of workers particularly representative of these evolutions. Indeed, as independent workers, their working times and spaces are more liable to spill over into private life. In addition, as IT workers, they often use the newest technologies. Technology has significant impacts on the organization of their work. As a result, studying their practices and behaviours regarding working times and spaces presents a double interest, since these have important impacts in terms of work–life issues. Moreover, the observed trends can have implications for other professional groups in coming years, since more and more occupational categories use these technologies.

In this paper, we present ways in which new information and communication technologies may impact the temporal and spatial permeability between work and non-work for self-employed IT workers. We first introduce a few elements on the scope and the context of self-employment in Canada and in Québec. Then we define the concept of permeability between work and non-work and explore the effects of ICTs on working times and spaces. Indeed, it is argued commonly that the use of ICTs tends to blur the boundaries between work and non-work (Besseyre des Horts & Isaac, 2006; Halford, 2005), but few studies have analyzed in detail the extent to which boundaries are blurred (D’Abate, 2005), and whether this blurring is erratic or follows some specific patterns. In order to bridge this gap, this research studies in detail the practices of spatial and temporal permeability between work and non-work of self-employed IT workers. In doing so, we identified some job characteristics and personal characteristics that are correlated with this permeability. We highlight the fact that there are two groups of respondents: one prefers to intertwine work and private life (integration), and the other prefers a distinct separation and little interference between work and their private life (segmentation). We found that women more often tend to be “separators,” whereas men tend to be “integrators.” In addition, respondents with dependent children tend to prefer segmentation to integration. This means women and parents experience less temporal and spatial permeability, which is quite a surprising result, since some authors point out that people with more family responsibilities tend use more flexible work arrangements to balance work and family (Greenhaus & Powel, 2006). Finally, we discuss the implications of our results for future research.

Self-employment in the IT sector

Social, economic, and political actors agree that there is no single definition of “self-employment.” Although the expression “self-employed worker” is most commonly used, the independent worker may be distinguished from other self-employed persons, who hire help. In the last census, Statistics Canada included in the self-employment category those who operate a farm either as owner or tenant; workers, for example, freelancers or contract workers (architects, private nurses, et cetera); franchise or concession holders in the sale or direct distribution of prod-
ucts (cosmetics, newspapers, et cetera); and those who fish, either with personally owned equipment or equipment in which they are co-owners. Nevertheless, work activities involved in the self-employment concept cover more ground and include the entrepreneur or contractor, the freelancer or the tradesperson, professionals remunerated per consultation or by contract, and day workers. In the framework of our research, and in keeping with Delage’s investigation on independent work (Delage, 2002), we shall consider self-employed the following: independent workers (self-employed and without hired help), self-employed workers who hire a very small number of associates—mostly casual freelancers under contract—and professionals in co-partnership on an individual basis.

According to the Labour Force Survey (Organisation for Economic Co-operation and Development, 2003), nearly 16% of all workers in Canada are self-employed, and 13% of workers in Québec. Self-employment registered the strongest increase among the various worker categories. The national average is close to that of most industrialized countries overall. In keeping with tendencies observed elsewhere, and although the proportion of self-employed workers remains higher among Canadian men than women, women display a higher percentage of growth in self-employment than men do. Indeed, according to 2001 figures, the growth in self-employment is 2.3% for men and 2.7% for women (Delage, 2002). Furthermore, many authors report huge differences between the reasons men and women choose self-employment (Clain, 2000). Women are generally focused on family reasons—they choose self-employment in order to have more time and flexibility for childcare, et cetera—while men go out on their own because of the financial gains and the increased control over their activities.

In the IT sector, the rise of self-employment is a notable trend (Ang & Slaughter, 2001), and Cappelli (2001) notes that the market for IT workers has been very tense in recent years. Businesses encounter personnel recruitment problems. Market demand is thus satisfied not only by large consulting firms but also by an increasing number of self-employed IT workers (Ang & Slaughter, 2001; Cappelli, 2001). Ang & Slaughter (2001) estimate that the number of freelance IT workers in the United States grew by 40% between 1995 and 1998. In the province of Québec, the Association of Freelance IT Workers (AQIII) reports a 20% average increase in its membership per annum since 2003. Self-employment has increased considerably in the IT sector.

Independent work is a growing form of employment in Canada, and it seems that more and more Canadians will be self-employed in coming years. The development of self-employment and of new forms of work organization allowed by ICTs may have important impacts on working spaces and times and on the blurring of boundaries between work and non-work, since both these trends are on the increase (Crague, 2003).

The evolution of work organization with ICTs
Telework, or working from home, is sometimes presented as a new form of work that is accessible in the context of information and communication technologies (Chapman, 1995; Hafer, 1992; Pratt, 1984). Telework and work from home can cover various realities. Indeed, in some research, telework can refer to work from home that can resemble piecework, while in others, telework only includes the
modern forms of working at home, based on the use of ICTs. It is true that working from home is not a new phenomenon per se; what are new are the extended possibilities for working from home while having access to office databases and the like through ICTs—and mobile technologies in particular. This more modern form of telework, using ICTs, has developed mainly from the 1990s on. Three forms of telework are generally distinguished: work at home, work in clients’ offices, and work in business centres or satellite offices. The time dimension can also serve to differentiate the various types of teleworkers, since the number of days spent out of the office can identify full-time home workers and part-time or occasional home workers, the latter only working a few hours or a few days a week from home (Tremblay, Paquet, & Najem, 2006). Many telework studies also include individuals who work from a distance for one or many organizations, and this can eventually include freelancers or the self-employed. Finally, the definitions and modes of telework are quite varied.

In this research, we limited the use of the expression “telework” to describing work from home, because self-employed IT workers themselves perceive an important difference between working at clients’ offices and working from home. Telework is thus defined as the part of work our respondents carry out from home using ICTs and paid by a client; we herein exclude unpaid work such as networking. In order to understand how our respondents organize their work time and workplace, it is important to distinguish between the types of work done at home. Indeed, Hislop & Axtell (2007) show how self-employed workers need to arrive at different forms of balance, dependent upon the particular way their work time is divided between their homes, employers’ premises, and other locations.

Telework and ICTs are generally reported to have ambivalent consequences. Indeed, telework is sometimes presented as a possible solution to work–family balancing problems or, on the contrary, as a problem in terms of work–life balance because of blurring of boundaries between working and non-working time (Baines & Gelder, 2003; Tremblay, 2002, 3003; Tremblay, Paquet, & Najem, 2006). Some authors argue that telework and the use of ICTs generate more work–family conflict due to the increased availability for work (Christensen, 1987), whereas other authors stress that they facilitate work–life balance through more flexible work arrangements (Anthias & Mehta, 2003; Felstead & Jeewson, 2000; Losococo, 1997). Many authors position telework as a way of being more productive. In theory, telework could increase effectiveness, allowing for fewer interruptions and disturbances and better concentration (Taskin, 2006a), but this increased productivity remains difficult to measure (Taskin, 2006b). However, the observations of Metzger & Cléach (2004) show that in the case of managers and professionals, telework is often considered a solution to deal with work overload. They conclude that telework can also reflect stressful working conditions!

The ambivalence of telework is very similar to the ambivalence of ICT: it can be a resource as well as a constraint for workers. Over recent decades, ICTs have enabled the spatial reconfiguration of work, opening up possibilities for work to take place in multiple locations (Halford, 2005). The use of mobile tools (such as laptops, cellphones, and BlackBerrys) has transformed work contexts, but it has also affected the traditional border between work and non-work activities.
According to Halford (2005), ICTs create spatial “hybridity,” which changes experiences of work, organization, and management across domestic and work places, which is a change from previous decades. Besseyre des Horts & Isaac (2006) suggest that the use of mobile ICTs has ambivalent consequences. Indeed, the development of ICTs represents a new resource for organizing work time and space more conveniently, but it also implies new constraints, such as 24-hour availability for work. It then thus creates new organizational demands. In the same movement, ICTs facilitate day-to-day work but also intensify strain at work. Metzger & Cléach (2004) identify various organizational stressors directly linked to ICTs: informational overload, pressure to answer emails or messages instantaneously, et cetera.

According to Peyrard & Peyrelong (1999), ICTs make it possible for workers to decide when and where they are available for work. These authors state that workers will use ICTs to create acceptable working universes between “being fully available for work” and “putting work at a distance.” This leads to a tension between two poles: one is characterized by a total availability for work and the other one by the will to withdraw from this availability. Thus, the use of ICT artifacts is liable to increase stress (making possible total availability for work) as well as to improve working conditions (offering an extended degree of control over the organization of work). Middleton & Cukier’s (2006) study on BlackBerrys explores how mobile email can be functional and dysfunctional simultaneously: users focus on the benefits and forget the dysfunctional aspects such as anti-social behaviour and infringement on private life. As the literature indicates, ICT represents a resource or a constraint, depending on the degree of autonomy of workers.

The general growth of ICTs and telework, since both are linked, would tend to increase spatial and temporal permeability between work and non-work activities (Genin 2007; Hislop & Axtell, 2007). Yet, as we would argue, the effects are varied according to certain characteristics. Indeed, the logic behind this spatial and temporal permeability can be very different, even contradictory (Middleton & Cukier, 2006). ICTs and telework can be experienced simultaneously as a constraint and as a resource for workers. In order to better understand these practices and their implications, let us further discuss different models of interaction between work and non-work.

**Interactions between work and non-work**

Traditionally, work and family are assumed to be separate domains in terms of time, space, and roles. The Industrial Revolution concentrated workers in factories, so that work became an independent system, separate from family (Adam, 1995; Taskin, 2006b). Moreover, since men traditionally held the role of breadwinner and women the role of homemaker, gender specification reinforced the partition between work and family. But today ICTs and telework are likely to initiate an opposite movement, blurring the traditional borders between work and family.

Clark (2000) proposed a work/family border theory, which analyzes the interconnection between these domains of life. According to the social roles theory (Katz & Kahn, 1978), work and family are two domains of life associated with various roles, rules, and behaviours. Clark (2000) defines borders as lines of
demarcation between domains. They mark the point at which the rules and behaviours related to domains start and finish. This definition of borders is very similar to the one proposed by Ashforth, Kreiner, & Fugate (2000). According to them, a border is the perimeter that delimits a role. They define role transition as the psychological movement between two roles, characterized by the disengagement from one role and the commitment to another role. Role transition corresponds to the border-crossing between two roles. We are all daily border-crossers. Moreover, Ashforth, Kreiner, & Fugate (2000) postulate that borders are idiosyncratic, which means they are different for every individual.

According to Clark (2000), borders between two domains of life are characterized by their permeability. “Permeability” represents the degree to which elements from other domains may enter a given domain. Pleck (1997) defines permeability between work and family as the degree to which demands from work interfere with demands from family, and vice versa. According to Clark (2000), there are three kinds of borders: physical, temporal, and psychological. A physical border, such as the wall of a workplace or of a house, defines spaces where domain-relevant behaviours take place. A temporal border, such as set work hours, determines when work is done and when family activities can take place. Psychological borders are rules created by individuals that dictate emotions, attitudes, and behaviours appropriate for one domain but not the other. Consequently, there are three forms of permeability between work and non-work (Clark, 2000), all of which are potentially reinforced by the use of ICTs:

• Spatial permeability: an individual may have an office at home;
• Temporal permeability: an individual can work during weekends, holidays, et cetera; and
• Psychological permeability: this corresponds to the spillover from one domain to the other.

The spillover model relies on the idea that individuals carry their emotions and attitudes from work at home and vice versa (Caligiuri & Cascio, 1998; Champoux, 1980). Edwards & Rothbard (2000) propose an enlarged model of spillover that integrates the similarities between rules and behaviours related to work and family. Spillover can be negative (Demerouti, Bakker, & Schaufeli, 2005; van Emmerik & Jawahar, 2006) or positive (Greenhaus & Powel, 2006; Kirchmeyer, 1992). This psychological spillover has most frequently been the object of analysis, while there are fewer studies on spatial and temporal permeability, on which we concentrate here.

The theory of permeable borders between work and non-work is linked to the concepts of integration and segmentation. “Segmentation” corresponds to voluntary separation between work and non-work, so that one domain does not affect the other. Initially, the model of segmentation emerged from the spatial and temporal separation between work and home (Edwards & Rothbard, 2000). However, the concept has evolved with contemporary ways of life. Today, the majority of authors consider segmentation an active process aiming to maintain an impermeable border between work and non-work home (Edwards & Rothbard, 2000; Rothbard, Philips, & Dumas, 2005; Tietze & Musson, 2002).
On the contrary, “integration” is a strategy that aims to integrate work and non-work activities, so that roles and times associated with each domain frequently overlap (Rothbard, Philips, & Dumas, 2005; Tietze & Musson, 2002). Integration and segmentation stand on a same continuum (Ashforth, Kreiner, & Fugate, 2000; Clark, 2000; Rothbard, Philips, & Dumas, 2005). It is also important to distinguish between effective segmentation or integration and the desire for segmentation or integration expressed by individuals (Rothbard, Philips, & Dumas, 2005). Ashforth, Kreiner, & Fugate (2000) associate the model of segmentation with impermeable borders between work and non-work and the model of integration with permeable borders. A strong permeability between work and non-work should reflect a strategy of integration, whereas impermeable borders should reveal a strategy of segmentation.

The results of several research studies converge on the fact that borders between work and non-work are asymmetrically permeable (Duxbury & Higgins, 1991; Eagle, Miles, & Icenogle, 1997; Kasper, Meyer, & Schmidt, 2005; Pleck, 1977). Most of them conclude that the borders of personal life are relatively permeable to work. The borders of professional life, however, appear to be less permeable to personal life. Moreover, mobile tools such as cellphones, laptops, and BlackBerrys are liable to increase border permeability, but it is not a direct relationship. Indeed, permeability between work and non-work depends on a set of constraints and opportunities associated with the use of ICTs (Besseyre des Horts & Isaac, 2006). Finally, most researchers argue that parental and professional identities are key factors to understanding work–non-work interferences (Duxbury & Higgins, 2003; Duxbury, Higgins, & Lee, 1993; Felstead & Jewson, 2000; Loscocco, 1997; Tremblay, 2002, 2003; Tremlay, Paquet, & Najem, 2006).

Much research has dealt with the psychological permeability—or spillover—between work and non-work (Demerouti, Bakker, & Schaufeli, 2005; Edwards & Rothbard, 2000; Greenhaus & Powel, 2006; Kirchmeyer, 1992; Rothbard, 2001; van Emmerik & Jawahar, 2006). However, there are fewer studies on the spatial and temporal permeability between these domains of life. That is why this research focuses on the spatial and temporal permeability of borders between work and non-work, and more specifically on the permeability of non-work to work, because it is the most common. To our knowledge, few studies have explored these forms of permeability in depth (D’Abate, 2005).

The activity of freelance IT workers provides a remarkable example of how ICTs are shifting the borders between work and non-work. Not only do they use computers in their daily work, but new mobile technologies such as cellphones, BlackBerrys, and remote access to clients’ databases also allow them to accomplish a great part of their job at home. Consequently, self-employed IT workers combine high levels of autonomy (they are independent workers) with an intense use of new information and communication technologies. Their practices regarding working times and spaces offer noteworthy examples of the kind of articulations between work and personal life that have emerged with the development of ICTs. Consequently, this exploratory research investigates the following question: What is the impact of new information and communication technologies on
the temporal and spatial permeability between work and non-work for self-employed IT workers?

**Surveying self-employed IT workers in Québec**

We now present the results of a vast survey carried out in collaboration with the Québec Association of Freelance IT Workers (AQIII: Association Québécoise des Informaticiennes et Informaticiens Indépendants). With more than 700 members, AQIII is the biggest association of independent IT contractors in Québec. This population appeared interesting because all our respondents used ICTs daily: cell-phones, laptops, and email, as well as BlackBerrys for some of them. The data were collected via the Internet during the spring of 2007. An email was sent to the 700 members of the association. It contained a hypertext link giving the members access to an online questionnaire.

The 116 respondents represent 17% of the total population of AQIII members. There were 116 participants at the beginning of the survey and 103 at the end, that is, a final retention rate of 89% throughout the questionnaire. A large majority of the participants were men (82%). This was to be expected, since the percentage of women in the total population of AQIII members is 12%. Eighteen percent of the survey participants were women, so women are overrepresented in the sample. The respondents were quite young: 71% of the participants were under the age of 44, and 53% were between 35 and 44 years old. Also, 80% of the respondents were living with a partner or spouse and 55% with dependent children. All the respondents were full-time, self-employed IT workers; 83% worked alone, having neither employees nor subcontractors. On average, the respondents had been self-employed for seven and a half years, they had an average of 17 years of IT experience. This means that the majority of participants had solid experience in IT before becoming self-employed.

This population differs from other Canadian self-employed workers, firstly because women are underrepresented. In 2007, women represented nearly 35% of all self-employed workers in Canada (Statistique Canada, 2008) and only 12% of AQIII membership. Secondly, self-employed IT workers generally earn more than their salaried counterparts (Cappelli, 2001; Kunda, Barley, Evans, 2002), whereas on average self-employed workers earn less than 80% of the income of salaried employees (Tal, 2008). A large majority of our respondents (80%) chose self-employment to improve their income; only 6% were pushed to self-employment by unemployment. Consequently, our sample of self-employed workers appears “privileged,” compared with other self-employed workers in Canada.

The questionnaire starts with general socio-demographic questions on age, gender, et cetera. The participants were asked to specify their family status (that is, their day-to-day living situation); the proposed responses were designed to include as many situations as possible. In addition, the participants were asked to specify the number of children living with them and the age of the youngest child. We considered children under 12 dependents (because according to Canadian law, children older than 12 can stay alone). Respondents were also asked to indicate their annual income and hourly rate, as well as how they were paid (by the hour or with a fixed amount negotiated in the contract). The participants were also asked to indicate the usual distribution of their workplaces (in hours per
week), as well as an ideal distribution of these workplaces. The questions on spatial and temporal permeability and on the attitudes related to permeability were developed and validated by Genin (2007). These concerned frequency of work at home in the evening, on weekends, and during holidays; frequency of professional communications after work, on weekends, during holidays; et cetera. For example:

- I work from home in the evening after work.
- I am called or I call others for professional reasons in the evening after work.
- I work at home on weekends.
- I am called or I call others for professional reasons on weekends.
- On average, I work during my holidays.
- I call others or I am called for professional reasons during my holidays.
- I have business travels that oblige me to sleep away from home.

In order to classify profiles of respondents, we used typological analysis (a k-mean procedure). This procedure is designed to identify groupings of respondents who share homogeneous patterns of permeability. Cluster analysis was performed using respondents’ scores on seven standardized items measuring temporal and spatial permeability. Thereafter, we conducted correlation analyses between the degree of permeability and socio-demographic characteristics: age, sex, presence of dependent children, and presence of a spouse or partner. The correlation coefficient measures the strength and direction of a linear relationship between the variables. Statistical analyses were conducted with SPSS 12.0.

Characteristics of permeability between work and non-work

Description of working spaces and times

In the case of self-employed IT workers, spatial permeability between work and non-work is particularly important between home and clients’ offices, since these workers rarely have another office of their own; they move between these places, at various frequencies and for various hours, depending on contracts. We observe, however, that they spend more time in clients’ offices than at home. Indeed, the results of this research first provide data on the usual distribution of workplaces for self-employed IT workers. On average, they work 32 hours and 18 minutes per week in the offices of client organizations, 4 hours and 30 minutes at home, and 1 hour and 42 minutes in an office rented for the purpose of work. This last information must be considered carefully because it is a mean; standard deviation is very important. In fact, some of the respondents work full-time in an office rented for the purpose of work, whereas many others do not rent any office at all. Table 1 gives the distribution of workplaces on a weekly basis.

We observe that telework is a frequent practice, since nearly 75% of the respondents work or have worked from home. However, home is not the main workplace. The majority of respondents work from home only occasionally, so we can conclude that telework is not the dominant form of work for self-
Temporal permeability appears as the overlap between “standard” professional time (i.e., eight to nine hours per day on weekdays) and “standard” personal time. Our respondents generally combine spatial permeability (work from home) with temporal permeability (work outside of standard working hours). Indeed, our respondents mainly telework outside of standard working hours. They frequently work at home in the evening after work. Only 7.8% of the respondents say they never work at home in the evening, whereas more than 50% declare it happens at least once a week. Moreover, telework largely appears to be a choice, rather than a constraint. Indeed, more than 52% of the respondents say they work at home to spend less time at their clients’ offices, and the same proportion prefers to complete certain tasks at home. Only one third of respondents state that they prefer to stay later at the client’s office rather than work from home.

ICTs, such as cellphones, email, and remote access to clients’ databases, make it possible for self-employed IT workers to re-organize their working spaces and times, with an extended “hybridity” of workplaces. For example, many respondents work at home in the evening. Work at home is a common practice, but professional communications in the evening after work are rarer. Approximately 30% of the respondents call others or are called for professional reasons in the evening more than once a month. The gap between the frequency of work at home and the frequency of professional communications at home shows that the activities carried out at home are different from the activities carried out during the day. Temporal permeability of non-work to work is composed principally of productive work (such as finishing a file or a program) and indirect communications, for example emails, which make it possible to desynchronize communication times. Direct communications in the evening, such as phone calls, are rarer. Consequently, self-employed IT workers may respond to emails from home, but they will not be interrupted by phone calls; to a certain extent, they appear to choose the elements they allow to invade their private sphere.

Working on weekends is a less widespread practice than working during the evening. However, 44% of the respondents work on the weekend at least once a month. So it seems that self-employed IT workers prefer to telework on weekdays (including evenings) rather than on weekends. In the same vein, professional communications on weekends are less frequent than on weekdays. For 67% of respondents, phone calls on the weekend are very rare or non-existent. As for

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Table 1: Average distribution of working places (per week)

<table>
<thead>
<tr>
<th>Working Place</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work at home</td>
<td>4h30</td>
</tr>
<tr>
<td>Work in an office rented for the purpose of work</td>
<td>1h42</td>
</tr>
<tr>
<td>Work at the client’s site</td>
<td>32h18</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>38h30</strong></td>
</tr>
</tbody>
</table>
work during the evening, respondents may work on weekends, but they prefer indirect communications (emails), in order to be able to choose when they work and avoid being disturbed by professional phone calls during their personal time.

Work during holidays is generally avoided: 95% of the respondents work during holidays fewer than six times a year. Keeping with this tendency, professional communications during holidays are also very rare: 95% of the respondents call others or are called for professional reasons during their holidays fewer than six times a year. Thus the respondents seem to protect their holidays from the permeability of non-work to work. They apparently respect holidays as non-work periods. These practices show a certain degree of autonomy, in the sense that respondents do not have to stay in contact with clients every day.

Telework and professional phone calls are far less frequent on weekends or holidays than on weekdays. These data lead us to conclude that there are various frequencies in temporal and spatial permeability. In other words, some elements (email or other interruptions) are more easily accepted at some moments than at others. Permeability is particularly common on weekdays. However, it is less significant on weekends (work on weekends) and on holidays (work on holidays), when workers are much less open to interruptions. The temporal permeability of non-work to work is thus much more important common during weekday evenings than during weekends or holidays. We can therefore conclude that borders between work and non-work are heterogeneously permeable according to daily (weekdays), weekly (weekends), and yearly (annual holidays) rhythms. The re-organization of working times and spaces allowed by ICTs takes place primarily at the level of weekdays. Self-employed IT workers do not seem ready to mix professional life with personal life at any time and place. Their practices regarding temporal and spatial permeability respect certain traditional rhythms or “standards” of working time (no work during weekends or holidays). In addition, the kind of work performed at home differs from the activities carried out at the client office. Telework is characterized by fewer direct communications (such as phone calls or face-to-face meetings) and more indirect communications (such as emailing).

The respondents appear relatively resistant to mobility. They tend to avoid business travel. Approximately 77% of the respondents stay away from home one or more nights for professional reasons fewer than three times a year. This may be due to the fact that they are self-employed and thus limit costs related to business travel, since they might have to assume those costs.

The gaps between the effective and ideal distribution of workplaces are very important, in particular between work at home and work at the client’s site. Our results stress a very significant demand for telework, with respondents wanting to do more telework partly to have more flexibility and autonomy in the organization of their working time. On average, the respondents would like to work 17 hours and 36 minutes per week at home, that is, 13 hours more than they currently work per week at home. In line with this observation, more than 60% of the respondents answered “yes” to the statement, “If my clients agree, I would like to work at home occasionally.” However, this demand mainly concerns occasional telework. Indeed, only 42% of the respondents would like to work at home permanently. So according to the respondents, an ideal distribution of workplaces
would be “fifty-fifty” between home and the client’s site (see Table 2). But this ideal distribution is often difficult to reach.

**Table 2: Gaps between the ideal and the effective distribution of working places (per week)**

<table>
<thead>
<tr>
<th>Working Place</th>
<th>Ideal Hours</th>
<th>Effective Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work at the client’s site</td>
<td>–14h54</td>
<td>+13h06</td>
</tr>
<tr>
<td>Work in an office rented for the purposes of work</td>
<td>+1 hour</td>
<td>+1 hour</td>
</tr>
<tr>
<td>(Total)</td>
<td>–48min</td>
<td>–48min</td>
</tr>
</tbody>
</table>

In spite of a relative autonomy regarding working spaces and times, independent workers face strong constraints from the demands and requirements of client organizations. The theoretical autonomy of self-employed IT workers meets a critical limit when it comes to authorizing telework. As a matter of fact, they cannot always decide on their own working times and spaces. Indeed, clients impose the workplace for nearly 46% of respondents. Only 11% of the respondents decide on their own workplace, and for 42%, workplaces are negotiated with clients.

Ultimately, this significant demand for telework reflects respondents’ desire for an extended spatial permeability between work and non-work. Nevertheless, their demand for telework is often limited countered by reluctant clients who prefer to have the workers on site most of the time. In the survey’s open questions, the issue of trust between self-employed workers and clients is among the main reasons why telework is refused: clients fear that self-employed workers would do less than they are paid for. As a result, these organizational factors tend to limit the full realization of the potential offered by ICTs. As our case study of this particular group of workers indicates, information and communications technologies, as well as mobile technologies, can theoretically improve self-employed workers’ control over working times and spaces. However, this possibility is sometimes limited by client organizations, which apparently prefer to have workers on site, although we will see further on that personal characteristics such as gender also have an impact.

In conclusion, the nature of work performed at home can follow various modalities, or in other words, the articulation of time and space is differentiated. Though work performed at home can consist of professional communications, it is more frequently characterized by production or reflection activities, which do not involve direct communications such as phone calls. It is interesting to see that the workers do not see all forms of work activities in the same manner; some activities are clearly preferred or unwanted at given times. We observed that when they work from home (or telework), our respondents prefer indirect communications, such as email, which allow them better control over their work.
activities. Indeed, they are not “disturbed” by professional phone calls; instead, they choose when and where they work. This could illustrate a “functional” utilization of ICTs (Middleton & Cukier, 2006). Moreover, the demand for telework we observed also constitutes a demand for more control over one’s work activities. This illustrates the tension generated by the use of ICTs (Besseyre des Horts & Isaac, 2006; Metzger & Cléach, 2004; Peyrard & Peyrelong, 1999). On the one hand, respondents have more flexibility to choose when and where they work; on the other hand, they have to deal with clients’ possible mistrust and/or the temptation to be available for work 24 hours a day.

There are rhythms and frequencies in temporal and spatial permeability between work and non-work. The spatial and temporal borders between work and non-work are more permeable during weekdays than during weekends or holidays. All borders are not identically permeable. The use of ICTs enables a reorganization of working times and spaces, and it also increases the degree of interference between work and non-work, but it has not led to the complete disappearance of borders. Personal life and professional life do not mix erratically and unconditionally. Our respondents develop active strategies regarding this permeability, but they are also facing strong constraints. After this general presentation, we now turn to the profiles of respondents in more detail.

Profiles of the respondents
As mentioned previously, little work has been done on temporal and spatial permeability, with more done on the psychological dimension (D’Abate, 2005), and it thus appeared important to look into these two dimensions and try to determine who participates and how they participate in this articulation of social times and places, that is, those of work and non-work. We undertook an analysis that leads to a typology that classifies our respondents according to their degree of temporal and spatial permeability (see Table 3). In the previous section, we saw that client organizations could limit permeability between work and non-work. In this section, we investigate the relationship between permeability and individual characteristics.

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Integrators</th>
<th>Separators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in the evening</td>
<td>5.04</td>
<td>3.34</td>
</tr>
<tr>
<td>Communications in the evening</td>
<td>3.79</td>
<td>1.91</td>
</tr>
<tr>
<td>Work during weekends</td>
<td>4.23</td>
<td>2.21</td>
</tr>
<tr>
<td>Communications during weekends</td>
<td>3.09</td>
<td>1.46</td>
</tr>
<tr>
<td>Work during holidays</td>
<td>2.87</td>
<td>1.48</td>
</tr>
<tr>
<td>Communications during holidays</td>
<td>2.55</td>
<td>1.50</td>
</tr>
</tbody>
</table>

Our results reveal that there are two groups of respondents with regard to permeability between work and non-work. The first group is composed of 47 individuals who strongly mix work and non-work (they work at home during weekends, holidays, et cetera). Their behaviour is characteristic of the “integration” strategy. The temporal and spatial permeability between work and non-work rises to high levels for this group. On the contrary, the second group is composed
of 56 individuals with separating behaviours. They try not to intertwine personal life with professional life. Temporal and spatial borders between work and non-work are relatively impermeable for this group, which reflects “segmentation” strategies.

Statistical analyses hence make it possible to identify two categories of very different behaviours with regard to permeability between work and non-work. The re-organization of working spaces and times permitted by ICTs must be considered in relation to the desire for integration or segmentation expressed by individuals.

Table 4: Gender and permeability

<table>
<thead>
<tr>
<th>Gender</th>
<th>Integrators</th>
<th>Separators</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>40 (50%)</td>
<td>40 (50%)</td>
<td>80 (100%)</td>
</tr>
<tr>
<td>Women</td>
<td>7 (30%)</td>
<td>16 (70%)</td>
<td>23 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>47 (46%)</td>
<td>56 (54%)</td>
<td>103 (100%)</td>
</tr>
</tbody>
</table>

We found no correlation between permeability and age; neither have we found any correlation with the presence of a spouse or partner (chi-square tests are not significant). Nevertheless, we found significant differences between men and women and between parents and non-parents. Men tend to be integrators more than women: only 30% of women are integrators, compared with 50% of men (see Table 4). Moreover, only one third of the respondents with dependent children are integrators; this proportion goes up to 63% for respondents without dependent children. It is very interesting to observe that respondents with dependent children do not integrate work and non-work as much as expected, since much literature stresses that family responsibilities lead to combining work and family at different times (see Table 5). It is mainly respondents without dependent children who tend to integrate work and non-work more (see Table 5).

Table 5: Dependent children and permeability

<table>
<thead>
<tr>
<th>Children</th>
<th>Integrators</th>
<th>Separators</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No dependent</td>
<td>27 (63%)</td>
<td>16 (37%)</td>
<td>43 (100%)</td>
</tr>
<tr>
<td>With dependents</td>
<td>18 (33%)</td>
<td>37 (67%)</td>
<td>55 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>45 (46%)</td>
<td>53 (54%)</td>
<td>98 (100%)</td>
</tr>
</tbody>
</table>

To conclude, these results are very interesting, since they show that people who generally have more family responsibilities (parents of young children and women) tend to prefer segmentation strategies. One might have expected respondents with family responsibilities to have high degrees of time permeability in order to deal with work and family demands in a more flexible way, but our results show the contrary. Respondents with fewer family responsibilities integrate personal and professional times, whereas parents of young children tend to separate both domains of life. Our data then appears to contradict theories presenting flexibility or permeability as an efficient way to balance work and family (Anthias & Mehta, 2003; Felstead & Jewson, 2000; Loscocco, 1997). This result is definitely quite surprising, and it would be interesting to investigate this issue further in future research.
We also found a link between the type of contracts and permeability. Indeed, the percentage of fixed-price contracts is positively linked to permeability (see Table 6). When our respondents are paid by the hour, they tend to act more as separators, probably because it is more difficult to charge clients for work done at home. As we saw, our respondents faced strong constraints when they asked for telework, principally due to clients’ mistrust. So the mode of payment affects permeability, encouraging it in the case of fixed-price contracts and discouraging it in the case of contracts paid by the hour. Consequently, we would recommend that self-employed IT workers preferring the integration strategy opt for more fixed-price contracts. Not only do family status and personal preferences have an influence on permeability, but the type of contract as well. Again, this is a result that is interesting, since this variable had not been highlighted previously.

**Discussion: The importance of gender, parenthood, and type of contract**

Though a lot of studies have focused on psychological permeability, or spillover (Clark, 2000), few have dwelt on temporal and spatial permeability (D’Abate, 2005). Our research thus contributes to the knowledge of the interferences between work and non-work with precise and detailed data on self-employed IT workers. Information and communication technologies enable extended spatial and temporal permeability between work and non-work for our respondents. Though this permeability roughly represents four and a half hours of work per week, we saw that it still respects some criteria attached traditionally to the rhythms of work. Temporal and spatial permeability is more frequent on weekdays than during weekends or holidays. It is clear that there are specific rhythms in the frequency of temporal and spatial permeability of non-work to work. Moreover, work done at home seems to differ from work done at the client’s office, and work at home does not include a lot of direct communication (i.e., few phone calls). These results are consistent with research predicting a re-organization of working times and spaces initiated by information and communication technologies (Besseyre des Horts & Isaac, 2006; Taskin, 2006b); furthermore, they indicate that this re-organization follows some traditional standards of working time.

In addition, it appears important to consider individuals’ desires for integration and segmentation in order to understand the permeability of borders between work and non-work. Typological analyses on respondents’ profiles emphasize the relevance of the integration and segmentation models (Ashforth, Kreiner, & Fugate, 2000; Clark, 2000; Rothbard, Philips, & Dumas, 2005; Tietze & Musson, 2002) to explaining the practices of permeability. The first group—respondents who prefer to intertwine work and personal life—corresponds to the integration model. The second group—respondents who prefer a distinct separation and lit-
tle interference between work and their personal life—illustrates the segmentation model. Interestingly, our results show that integration and segmentation are linked to gender and the presence of young children, but not necessarily as was expected. It appears that women and parents of young children prefer segmentation strategies, a result that questions the positive effect of ICTs on work–life balance through a possible integration of work and family responsibilities that is highlighted in other research (Baines & Gelder, 2003; Duxbury & Higgins, 2003; Tremblay, 2003). The effects of ICTs on permeability also depend on other factors. On the one hand, there is a significant demand for telework. Our respondents would like to work nearly 18 hours a week at home, but it is often impossible due to the refusal of clients. We also found a correlation between the degree of temporal and spatial permeability and the type of work contracts. The percentage of fixed-price contracts is linked to integration strategies. This underlines the importance of autonomy and trust between self-employed workers and their clients. The potential offered by ICTs is reduced when self-employed workers have a low degree of autonomy to choose their working times and spaces due to clients’ mistrust. Temporal and spatial permeability between work and non-work not only depends on the strategies privileged by the respondents, but also on the constraints imposed by their clients.

Crague (2003) noted that contrary to the activities of blue collars, professionals’ and managers’ activities typically imply a variability of workplaces. He adds that this variability is strengthened by the use of ICTs. A joint survey by the Chronopost Institute and Ipsos showed that the use of ICTs increases time permeability between personal and professional life. This makes the case of self-employed IT workers particularly interesting for our purpose. Indeed, our results show how job characteristics (type of contract and requirements of the client) can influence temporal and spatial permeability. On the other hand, our results also show how individual characteristics, such as gender and the presence of young children, are correlated to integration or segmentation strategies. Surprisingly, we found that respondents with more family responsibilities tend to prefer the segmentation strategy, and surely, this is an important point to investigate in more depth in future research.

Finally, as with all research, this study has some limitations. The size of the sample and its characteristics (IT sector) do not make it possible to generalize the results to the full population of self-employed workers in Canada. Indeed, on average, self-employed IT professionals earn more than their salaried counterparts, whereas the opposite situation is observed for self-employed workers in general. This also underlines the heterogeneity of self-employed workers and the influence of professional categories. It would therefore be interesting to study temporal and spatial permeability among other categories of self-employed workers in future research. This research has also highlighted the interest of studying specific professional categories of self-employed workers; much research tends to lump them into one homogeneous group, which is obviously not what should be done on the issue of permeability between work and non-work, since the analysis of a specific category highlights interesting dimensions.
References


Organisation for Economic Co-operation and Development.


Appendix 1
k-mean analysis: Iteration history

<table>
<thead>
<tr>
<th>Iteration</th>
<th>Change in Cluster Centers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.108 3.131</td>
</tr>
<tr>
<td>2</td>
<td>0.177 0.168</td>
</tr>
<tr>
<td>3</td>
<td>0.119 0.106</td>
</tr>
<tr>
<td>4</td>
<td>0.000 0.000</td>
</tr>
</tbody>
</table>

Convergence achieved due to no or small change in cluster centers. The maximum absolute coordinate change for any center is 0. The current iteration is 4. The minimum distance between initial centers is 9,899.

Number of cases in each cluster

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Integrators</th>
<th>Separators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>47.000</td>
<td>56.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>103.000</td>
</tr>
</tbody>
</table>

Appendix 2
Chi-Square tests: gender * permeability

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
<th>Exact Sig. (2-sided)</th>
<th>Exact Sig. (1-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>2.756 (b)</td>
<td>1</td>
<td>0.097</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuity Correction (a)</td>
<td>2.024</td>
<td>1</td>
<td>0.155</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>2.830</td>
<td>1</td>
<td>0.093</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fisher’s Exact Test</td>
<td>0.153</td>
<td></td>
<td>0.076</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linear-by-Linear Assoc</td>
<td>2.730</td>
<td>1</td>
<td>0.099</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N of Valid Cases 103

a Computed only for a 2x2 table
b 0 cells (0.0%) have expected count less than 5. The minimum expected count is 10.50.

Appendix 3
Chi-Square tests: Dependent children * permeability

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
<th>Exact Sig. (2-sided)</th>
<th>Exact Sig. (1-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>8.783 (b)</td>
<td>1</td>
<td>0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuity Correction(a)</td>
<td>7.614</td>
<td>1</td>
<td>0.006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>8.893</td>
<td>1</td>
<td>0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fisher’s Exact Test</td>
<td>0.004</td>
<td></td>
<td>0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linear-by-Linear Assoc</td>
<td>8.693</td>
<td>1</td>
<td>0.003</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N of Valid Cases 98

a Computed only for a 2x2 table
b 0 cells (0%) have expected count less than 5. The minimum expected count is 19.74.

Appendix 4
ANOVA Table: Permeability * percentage of fixed price contracts

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups (Combined)</td>
<td>1676.279</td>
<td>1</td>
<td>1676.279</td>
<td>7.523</td>
<td>0.007</td>
</tr>
<tr>
<td>Within Groups</td>
<td>18715.953</td>
<td>84</td>
<td>222.809</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20392.233</td>
<td>85</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>