The interplay between organizational polychronicity, multitasking behaviors and organizational identification: A mixed-methods study in knowledge intensive organizations

The interplay between organizational polychronicity, multitasking behaviors and organizational identification: a mixed-methods study in knowledge intensive organizations

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Abstract

This paper investigates how individual perceptions and attitudes about an organization influence multitasking behaviors in the workplace. While we know that individuals are significantly influenced in their behaviors by the characteristics of their organizations (e.g. ICTs, organizational structure, physical layout), we still do not know much about how the way individuals interpret their organization influences their multitasking behaviors. Thus, we specifically hypothesize that the individual perception of the organizational preferences for multitasking (i.e. organizational polychronicity) engenders the actual multitasking behaviors that an individual enacts in the workplace. We also hypothesize that the attachment to the organization (i.e. organizational identification) moderates the above relationship. We conducted a mixed method study in two knowledge intensive organizations (an R&D unit and a university department) and collected data through a survey, diaries, and semi-structured interviews. Our findings support the first hypothesis but not the moderating role of organizational identification. However, this latter is directly related to how much a person is willing to work on multiple activities on a single day. Further, our study suggests that not only the organizational context should be investigated in the study of multitasking behaviors, but also the larger work context, including the individuals' professional communities. We conclude with a discussion of theoretical and practical implications as well as methodological reflections on mixing methods in the study of multitasking in organizations.

Keywords: multitasking; knowledge intensive work; polychronicity; organizational identification; mixed-methods; diaries

1. Introduction

The literature on multitasking and interruptions has significantly furthered our understanding on how individuals behave in multitasking environments (e.g. Salvucci and Taatgen, 2011) and react to interruptions (e.g. Grandhi and Jones, 2010; Trafton and Monk, 2007), on the antecedents of individual behaviors and management strategies (e.g. Mark et al., 2012), and on the consequences in terms of individual psychological states as well as group outcomes, such as individual overload (e.g. Wickens, 2008) or coordination (e.g. Perlow, 1999). However, a significant amount of this research, conducted in diversified fields such as human-computer interaction, computer-supported collaborative work, IS, and psychology has overlooked the role of the workplace context in the understanding of multitasking and interruptions and, in particular, has left us with a number of questions on how organizations influence their employees' multitasking behaviors. Among the notable exceptions we find the seminal work by Perlow (1999) that shows how organizational norms regarding time use influence the organizational members interrupting behaviors, and the work by Dabbish et al. (2011) that shows how the organizational environment influences self-interruptions. The works in this line of research (see also Harr and Kaptelinin, 2007; Harr and Kaptelinin, 2012) started to uncover the role of organizational environments, but largely overlooked the importance that the individuals' *perceptions* of the organizational context have in conditioning the way they work.

Organizations and the perceived demands that they entail play a fundamental role in individuals' life and influence their behaviors because they desire to be evaluated positively and accepted by coworkers and organizational members at large (Blount and Leroy, 2007). Thus developing a more profound understanding of how individual

multitasking behaviors are embedded in the interpretation of the organizational work context is of both theoretical and practical importance.

The aim of this paper is to explore how the individual interpretation of organizational context influences individual multitasking behaviors. Specifically, we will focus on how individuals perceive the organizational temporal norms and are attached to the organizations they work for. For organizations that face intensified competition and fast-paced environments, the management of temporal issues is of paramount importance (Ancona et al., 2001) and the way individuals perceive and experience time is central to groups and organizations' functioning (Schein, 1992). Among the temporal-related organizational variables, we argue that organizational polychronicity, or the individual members' perception of the organization's time use preference (Slocombe and Bluedorn,1999), plays a prominent role in influencing how people deal with multiple tasks. At the group or organizational level of analysis, polychronicity has been conceptualized as a dimension of culture (Bluedorn et al., 1999; Hall, 1959; Schein, 1992; Souitaris and Maestro, 2010) and it reflects the preference for the involvement of individuals or groups in several tasks simultaneously as opposed to a preference for completing tasks sequentially that, conversely, characterizes a monochronic orientation. Thus, organizational polychronicity refers to perceived organizational preferences about the sequencing of activities and reflects how organizations prefer to allocate one of the most precious resource of their members, that is their work time (Souitaris and Maestro, 2010).

Building on research on multitasking (e.g. Salvucci and Taatgen, 2011; Trafton and Monk, 2007) and time and polychronicity (e.g. Bluedorn et al., 1999; Hall, 1959, 1983), we argue that individuals who perceive their organization as more polychronic will engage in more multitasking behaviors. Also, building on Social Identity and

Organizational Identification theories (e.g. Ashforth and Mael, 1989; Dutton et al., 1994) we propose that the strength of organizational identification will positively moderate the above relationship. Individuals highly identified with their organization see the organization's attributes as self-defining and are deemed to be more willing than their low identified counterparts to promote the organizational values and norms and engage in subsequent identity-congruent behaviors. Highly identified individuals who see their organization as highly polychronic should thus try harder to engage in multitasking behaviors.

We investigate the relationship between perceived organizational polychronicity, multitasking behaviors, and organizational identification in two knowledge-intensive organizations that are devoted to research and development: an engineering university department and the R&D unit of an organization that operates in the alternative energy industry. To collect our data we adopted a mixed-methods research approach. In particular, we collected data through a structured survey, the recording of diary data and qualitative semi-structured interviews. The variety of methods allowed us not only to test our hypotheses but also to develop a more nuanced understanding of how individuals made sense of what they believed their organizations asked from them and how they dealt with multiple tasks.

2. Theoretical background and hypotheses development

2.1. Multitasking in organizations

Knowledge intensive organizations, such as research and development units, software houses, or university departments, increasingly ask their employees to work on multiple activities, projects, and tasks in one single day or in shorter periods of time (Bertolotti et al., 2012; Bluedorn, 2002; O'Leary et al., 2012). In addition, knowledge

workers are now intensively using collaborative technology (e.g. email, IM) that, on the one hand, enhances the possibility of being in multiple teams and projects simultaneously, while, on the other hand, increases the interruptions one generates and receives (e.g. Bertolotti et al., 2012; Li et al., 2012). The described scenario is characterized by a high level of multitasking a single individual deals with in his or her work.

In order to set the stage for our study, it is important to clarify how previous studies define multitasking and the specific position that we take in our research. Multitasking generically refers to situations where individuals are asked to shift their attention between several independent, but concurrent, tasks (Adler and Benbunan-Fich, 2012). This definition, which is quite broad, encompasses situations where an individual is simultaneously doing more than one task (e.g. a subject of an experiment who is asked to drive and text at the same time) and situations where a person moves back and forth between tasks before completing them (e.g. a consultant working on different projects during a day). According to Salvucci and Taatgen (2011) and Gould et al. (2012), it is possible to integrate these different instances of multitasking and, as a consequence, the different disciplinary approaches that investigate it. For doing so, Salvucci and Taatgen (2011) propose the definition of multitasking behaviors on three continua: the multitasking continuum, the application continuum, and the abstraction continuum. According to these authors, on the two extremes of the multitasking continuum we find *concurrent multitasking*, i.e. individuals switching tasks at sub-second intervals up to few seconds, and *sequential multitasking,* i.e. individuals switching tasks after lengthy periods of execution. On the two extremes of the application continuum, we find studies that investigate real world tasks and studies that designed laboratory tasks. Finally, the abstraction continuum defines the

granularity of the time scale under study and distinguishes between biological band (milliseconds), cognitive band (seconds), rational band (minutes), and social band (days/weeks/months). According to the 'band' of the study, researchers have been interested in issues of multitasking related to: eye movement (biological band, e.g. Cane et al., 2012), switching between different applications on a smartphone (cognitive band, e.g. Möller et al., 2013), moving between different work tasks (rational band, e.g. Perlow, 1999), and keeping in touch with family and friends (social band, e.g. Baym et al., 2004).

Given our interest in how perceptions of the organization influence how individuals move between different tasks in the workplace, the focus on our study will be on sequential multitasking and we will position ourselves on the applied continuum and rational band[1].

2.2. Multitasking and organizations

The studies that specifically investigated the interplay between the organizational context and multitasking behaviors are still limited; consistently, Harr and Kaptelinin (2007) suggest that research would greatly benefit from the inclusion, in extant models, of collective and organizational factors. Table 1 summarizes our literature review on the topic.

Insert Table 1 about here

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[1] By focusing on sequential multitasking and the rational band we do not intend to underestimate the interplay between concurrent multitasking, analyzed at different levels of granularity, and organizational variables. We leave this other topic to future research, as we detail in our discussion.

Some studies, especially in the organizational behavior and management fields looked at the consequences of multitasking behaviors and interruption management strategies for employees, work groups and organizations (e.g. Perlow, 1999; Wickens, 2008). For instance, in his ethnography on 45 engineers, Perlow found that individuals experienced a constant pressure to respond to crises and a short-time oriented approach to problem solving. They enacted a pattern of constant interruptions that amplified multitasking behaviors and hampered coordination, with negative implications for the overall organizational performance. The works of O'Leary et al. (2009) and Mortensen et al. (2007) reinforce Perlow's argument by describing how coordination is impaired in organizational contexts characterized by high levels of multitasking where individuals work on multiple teams and projects simultaneously. Other studies underlined that extreme multitasking behavior is associated with delayed completion of tasks, higher frequency of errors, lower ability to think creatively, and worse decision making (Appelbaum et al., 2008; Gendreau, 2007).

On the other hand, other works underline, under certain conditions, the positive work outcomes of multitasking. Zellmer-Bruhn's research supports the idea that interruptions of work activities increase knowledge transfer efforts and knowledge transfer acquisition within work groups and that knowledge transfer effort is a mediating variable between interruptions and knowledge acquisition (Zellmer-Bruhn, 2003). O'Leary et al. (2009, 2011) and Bertolotti et al. (2012) propose that, when individuals are engaged in multiple teams simultaneously, the teams they belong to benefit from the different sources of knowledge they can access. However, when the number of 'multiple team memberships' increases above a certain threshold, increased multitasking levels within teams generate attention issues that impair team performance. Mark and colleagues (2005) find that a task switching within the same

"working sphere" (i.e. unit of work) yields a beneficial effect, while when the switch entails a context change its effects are disruptive. In particular, switching tasks within the same working sphere can help individuals think about their task and, more generally, can foster positive interactions between tasks. On the other hand, when switching between different working spheres the process of recalling what the individual was doing in the previous task entails a high memory cost and can lead to redundant work. In addition, circumstances such as requests by colleagues can trigger the emergence of unexpected working spheres that must be attended to. This process requires individuals to juggle their attention between expected and unexpected activities often unrelated to each other (see González and Mark, 2005), with negative implications for individual work productivity. For example, unforeseen changes in the task context impair decision making (LePine et al., 2000) and require individuals to put in practice coping behaviors that inevitably lead to fragmented work (González and Mark, 2005).

If we move from the organizational outcomes to the organizational antecedents of multitasking behaviors, we find that the studies that investigated how the organizational context and characteristics influence multitasking have looked at the role of coworkers, the physical office layout, work allocation and organizational design, ICTs, and organizational norms. In relation to the role of colleagues, González and Mark (2004) and Harr and Kaptelinin (2007) observe that individuals shift frequently between tasks because of coworkers' requests. The individuals shadowed by González and Mark (2004) stated to prefer working on a single task before switching to another one, but this was rarely the case because of their coworkers asking for attention. Furthermore, Dabbish and colleagues (2011) focus on self-interruptions and describe how people working in open-offices self interrupt more

than people working in traditional workspaces. Here it is the organizational physical layout that influences multitasking behaviors. More generally, Fayard and Weeks (2011) observe that different dimensions associated to the physical space, i.e. proximity, privacy, and permission, affect how people interact with and interrupt others at work. For example, Harr and Kaptelinin (2012) propose that individuals take the physical characteristics of the location where they are based into account when deciding if and when interrupting others and Whittaker et al. (1994) find that people tend to have impromptu conversations in public spaces more than in private ones. O'Leary et al. (2011) suggest that the managerial practice of allocating professionals on multiple teams simultaneously engenders extreme multitasking behaviors. Other authors underscore how flat organizational structures and the intense use of ICTs in organizations increase the number of interactions between individuals as well as interruptions and multitasking behaviors (e.g. Appelbaum et al., 2008; Harr and Kaptelinin, 2007; Li et al., 2011). Finally, Perlow (1999) shows how the individual perceptions of organizational norms regarding time use influence organizational members interrupting behaviors. In particular, the engineers' disruptive patterns of interactions and interruptions (where individuals were active interrupters but avoided receiving interruptions) were driven by the way they experienced two elements of the temporal and social context: the behaviors of managers who frequently asked them to pay attention to novel and urgent requests (delaying the conclusion of the current work until it could generate a crisis), and the incentive system that appraised positively individual and not collective performance.

The latter work suggests that not only organizational features matter in defining multitasking behaviors, but also that individual perceptions of what the organization considers acceptable, promotes and values, play a prominent role. However, we are

not aware of other works that further explore this issue. Thus, the focus of our work is on how the way individuals make sense of their organizations influences their multitasking behaviors. Among the different variables that link individuals to their organization we focus on organizational polychronicity and organizational identification.

2.3. The relationship between organizational polychronicity and multitasking behaviors

In the past decades, research in a variety of fields increasingly focused on temporal issues and preferences for managing time at the individual, group, organizational and even societal levels (Ancona et al., 2001; Blount et al., 2004; Mohammend and Harrison, 2013; Zhang et al., 2005). In the context of knowledge professionals, for whom work-time is a precious and scarce resource, polychronicity represents a fundamental temporal element because it relates to the ways of organizing activities and concerns how many things individuals prefer to be involved with simultaneously (Kaufman-Scarborough and Lindquist, 1999; Luximon and Goonetilleke, 2012; Zhang et al., 2005).

Consistent with the pioneering anthropological studies of Hall and Hall (1990), which considered polychronicity as a cultural element distinguishing monochronic cultures (e.g. North Americans and Northern Europeans) and polychronic cultures (e.g. Latin Americans), polychronicity has been considered one of the temporal dimensions of organizations' culture (Bluedorn et al., 1999; Onken, 1999). As a cultural variable, Bluedorn and colleagues defined polychronicity in organizational contexts as the extent to which people (1) prefer to be engaged in two or more tasks simultaneously; and (2) believe their preference is the best way to do things (1999: 207). Polychronic

organizations, therefore, are those perceived by their members to value the involvement of professionals in two or more tasks at once. For instance, in a project-based organization characterized by a polychronic time orientation, preferences would be for an organization of work so that professionals, within the same work day or even a morning, switch back and forth among projects and spend only a limited period of time on each of them. Conversely, a project-based organization characterized by a more monochronic time orientation would privilege the professionals' involvement in a single project in the entire day or the morning.

Consistent with the above definition of polychronicity, that includes both values and beliefs, organizational polychronicity has been operationalized through several multi-items scales where respondents are asked to report their perceptions of the time use orientation of their organization. Exemplary items ask the extent to which in the organization 'they like to juggle several activities at the same time', 'they believe people should try to do many things at once' or 'believe that people do their best when they have many tasks to complete' (e.g. Bluedorn et al., 1992; Bluedorn et al., 1999).

Since it is suggested that cultural norms and time orientations have the potential to impose certain structures on the work days and influence communication and interactions (Schein, 1992) and because individuals strive for congruence between their meaning of work and what they actually do in organizations (Wrzesniewski and Dutton, 2001), we expect that what individuals perceive the organization asks them to do, i.e. the perceived organization's polychronicity, strongly drives their multitasking behaviors. Thus, we hypothesize that the perception of organizational polychronicity is positively related to multitasking behaviors.

H1: Individual perceptions of organizational polychronicity will be positively related to individual multitasking behaviors in organizations.

2.4. The moderating role of organizational identification on the relationship between organizational polychronicity and multitasking behaviors

Organizational identification has been defined as a process of self-definition which is said to occur "when an individual's beliefs about the organization becomes self-referential or self-defining" (Pratt, 1998: 172). The level of identification indicates the extent to which individuals feel a cognitive connection with their organization, and integrate into their self-concepts the same attributes as those of the perceived organizational identity (Ashforth and Mael, 1989; Dutton et al.,1994). The attention paid by organizational scholars to understand why and how individuals become identified with an organization stems from evidence that strong identification leads to a number of consequences, important for both the individuals and the organization. For instance, high levels of identification influence tenure intention (O'Reilly and Chatman, 1986), intense loyalty (Adler and Adler, 1988), commitment (Bergami and Bagozzi, 2000; Foreman and Whetten, 2002), and work effort (Bartel, 2001). Of particular interest for our study is evidence that organizational identification drives individuals to comply with organizational dictates and to engage in on-the-job decision-making processes and sense-making activities in ways that favor the organization or that are aligned with the organizational culture (Cheney, 1983; Pratt, 2000). For instance, individuals highly identified with their organization are willing to engage in personally costly behaviors (Ashforth et al., 2008).

Since organizations, especially those devoted to knowledge intensive activities and learning, are now characterized by values and structures involving different notions of

time (Benabou, 1999) and differences in managing time can be used to distinguish one organization from another (Schriber and Gutek, 1987), the time management orientation of an organization can be considered as a central attribute of the organization's identity. Identity is in fact defined in relation to the existing culture (Fiol et al. 1998) and scholars have proposed that organizational culture can provide individuals with cues that help them making sense about what their organization stands for (Ravasi and Schultz, 2006).

Therefore, we can expect that strongly identified individuals will try hard to be responsive to their perceptions of the organization's requirements and make choices in terms of multitasking behaviors accordingly. That is, the relationship between perceptions of the organization's polychronicity and multitasking should be stronger for those individuals highly identified with their work organization than for those who are not so highly identified. Thus, we propose that strength of organizational identification moderates the relationship between perceptions of the organization's polychronicity and multitasking behaviors:

> *H2: The strength of organizational identification moderates the relationship between the perceptions of the organization's polychronicity and multitasking behaviors; the higher the organizational identification, the stronger the relationship between the perceptions of organizational polychronicity and multitasking behaviors.*

3. Data and Methods

In order to test our hypotheses and further understand the complex interplay between how individuals perceive their organizations and multitasking behaviours, we conducted a mixed-methods study in two organizations devoted to research and development activities. We followed a sequential procedure, which entails researchers expanding the findings of one method with another

method (Creswell, 2003). Specifically, our study was composed of two phases. It began by collecting data from a survey and diaries to test our hypotheses and it was followed by a detailed exploration through interviews.

3.1. Research settings

We conducted our study with knowledge professionals employed in the R&D Unit of a mechatronic company and academics in a University Department of Engineering. We chose these organizations because, for knowledge professionals, issues related to multitasking are of particular relevance (Applebaum et al, 2008; Gonzalez and Mark, 2004). In addition, knowledge intensive work in industry and academia is characterized by more polychronic temporal cultural norms where time is more elastic as compared to other work contexts (Benabou, 1999). Finally, both research sites were willing to offer access to a variety of sources of data on work structure and time allocation, actions and interactions patterns. Of course, the two sites present relevant differences, in terms of industry, structure, and objectives that we detail and comment next.

The R&D Unit is a medium-sized division of a world-leading company operating in the alternative energy industry and headquartered in Italy. Here, technicians and engineers (mechanical, electronic, mechatronic, electrical, and industrial) are involved in the research and development of advanced technological systems using clean energy sources, such as CNG (compressed natural gas) and LPG (liquefied petroleum gas). Professionals are asked to work, concurrently, on several projects that can be assigned to the creation of a system (or subsystems) for a specific client (an Original Equipment

Manufacturer-OEM) or for final customers (an After Market solution). Projects last, on average, 13 months. When we collected our data there were 40 active projects.

The University Department belongs to a major Italian University in Northern Italy, and it is composed of 88 individuals (including permanent and temporary workers). The Department defines itself primarily as a research institution, and is characterized by great multidisciplinarity of its faculty members and staff. Most department members work in mechanical, electronic, mechatronic, electrical, and industrial engineering fields. Department members work simultaneously on multiple research projects, funded by the European Union, The Italian Ministry of Research, private and public institutions, and private companies. Fund raising is conducted by individuals and groups because the Department does not provide financial support on top of the basic salary. In addition to conducting research, professionals are asked to take a minimum load of teaching and service activities (e.g. being part of the quality assessment committee).

3.2. Data collection

3.2.1. Survey

In order to measure organizational polychronicity, individual identification with the organization, and informants' characteristics we developed a multi-section questionnaire composed of several established scales. We provide details on specific measures in the next section. In the R&D Unit, since the study was supported by top management, all of the 83 members returned the questionnaire with a 100% response rate. Because of some missing data, the usable questionnaires that were included in the analysis were 71. Seventy of the 71 respondents were male; their average age was

34 years (s.d. = 7.3) and they had worked with the organization for an average of five years (s.d. = 5.5). Their professional tenure was 11 years (s.d. = 9.34).

In the University Department, we administered the questionnaire via the Internet to all 81 research employees (administrative people are not included in the study). After one month and two reminders, 71 questionnaires were returned and usable (response rate= 87.6%). Forty-nine respondents were male. Their average age was 35 years (*s.d.* = 8.7 years). They had worked at the University for an average of eight years (*s.d.* = 5.2). With regard to their position within the Department, 10 were Full Professors, 12 were Associate Professors, 15 were Assistant Professors, 16 were PhD students, 18 were contract workers employed on specific research projects.

3.2.2. Diaries

Diaries are another main data gathering technique that we employed. In particular, one section of the survey required professionals to compile a diary referred to all the activities and events occurred during the previous work day. Diaries obtained *in situ* have a high ecological value, because they express the users' real environment (Czerwinski et al., 2004). However, the process of observing and recollecting can be troublesome in at least three ways. First, it can create retrospection and rationalization biases especially when participants have to retrospect over weeks and months (Bolger et al., 2003; Gouveia and Karapanos, 2013). Second, it can pose a "Heisenberg-style" challenge in that "journaling tends to add to the interruption of the flow of daily events" (Czerwinski et al., 2004: 176), or it can either change the individuals' habits or reduce the reporting rate (Möller et al., 2013). A third problem pertains to the fact that different informants provide information with different levels of details. Our diary study design addresses these three points. In specific, as above detailed, we asked individuals to self-report activities carried out during the work day prior to the

compilation of the diary. This should sufficiently counterbalance the problems posed by "Heisenberg-style" challenge and retrospective bias. Moreover, we think that the short time-frame of the diary could have played an important role in spurring individuals to report their activities without influencing the natural flow of activities of the studied environment. Furthermore, in order to deal with the time burden problem, we obtained formal support from top management and made a formal presentation of our research design in order to explain why we needed such data. Informants' reporting behavior indeed was different with some informants describing their activities with a granularity of minutes, others using hours. Moreover, some informants provided detailed descriptions of their activities, while others did not. As suggested by Hess and Wulf (2009) to address this issue, we complemented diaries with semi-structured interviews. By doing this, the information described by individuals in the diaries became markers, which sketched a picture, and interviews helped in giving meaning to it.

In the diary, we asked our informants to record every phenomenon, such as events and interactions, according to a chronological pattern. This conveniently vague definition allowed us to understand "the different conceptual levels of task types that users might deem important enough to write down" (Czerwinski et al., 2004: 176). We additionally asked individuals to detail the time length of every phenomenon and whether it was expected or unexpected, i.e. if it was previously scheduled in their personal agenda or not, (e.g. Gonzales and Mark, 2005). In both contexts, knowledge professionals held a daily agenda (electronic or on paper) that incorporated the activities they planned to work on. Finally, we asked our informants to answer the following question: How did the specific phenomenon affect your work in progress?

We used diary data to build measures of multitasking behaviors (described in the next section). In addition, diaries allowed us to grasp how individuals account for their daily activities, according to what patterns they are used to organizing their time, with whom they interact, and what effects interactions are perceived to have upon their own and their co-workers' practice. The format of the journals is partially inspired by Perlow's (1999) own diary format. The diary of one of our informants is reported, as a meaningful example, in figure 1.

Insert Figure 1 about here

3.2.3.Interviews

While we used the data collected though the survey and diaries for hypotheses testing, we additionally interviewed some respondents to gain a profound understanding of the issues we focused on and the context within which these professionals worked. This evidence helped us in further interpreting the results. In the R&D Unit we conducted six preliminary interviews with the R&D manager, the human resource manager, and four senior managers, and 10 follow up semi-structured interviews (Gubrium and Holstein, 2003) with six engineers and four project managers. In the University Department, we conducted seven interviews. Each interview lasted between one and one and one-half hours. We asked our informants to comment about the diary they filled in, their work, how they managed their work-time, how they described their organization and the requirements it placed upon them, and how they defined themselves as professionals. We also investigated the informants' perceptions of interactions and interruptions and the consequences in terms of multitasking behaviors and if they had strategies to manage them.

3.3 Measures and reliability

3.3.1 The perception of the organization's polychronicity

Bluedorn and his colleagues (1992, 1999) have developed and validated a scale to assess the organization's polychronicity. Consistent with similar studies (e.g. Souitaris and Maestro, 2010) we measured the extent to which the organization was perceived to be polychronic using a concise five-item version of the scale (Bluedorn et al., 1992). Each item (see appendix) was scored on a 7-point Likert scale with 7= strongly agree and 1= strongly disagree (Cronbach's alpha = 0.75).

3.3.2. Multitasking Behaviors

In order to capture the multiple facets of sequential multitasking behaviors we computed different measures from diary logs. The measures we computed can be grouped in two different sets. In the first set we have the variable that we named 'number of tasks' that measures the number of activities a person moves between during a day. This equates the number of switches during a day plus one. Switching between different activities can be planned or unplanned, i.e. individuals can have an agenda filled with different activities and they adhere to them or different activities can emerge unexpectedly during the day, thus disrupting the original agenda. In a second set of four variables we included the 'unexpected' in our measure of multitasking. We computed the number of times an individual attends to an unexpected activity ('unexpected tasks'). For example, in the diary of Figure 1, the subject, during the day, is engaged in an unexpected call with a supplier and a problem with a software installation on a PC that requires him to work on the issue and participate in a meeting. We also computed the number of times an individual switches between an expected and an unexpected activity or vice versa ('expected/unexpected switches'). This latter measure reflects if a person sequences

his/her work activities into clearly separated ‘chunks’ of expected work and unexpected work or if she prefers to intertwine expected and unexpected activities. We computed the rate of the number of unexpected activities over the total amount of daily activities (we named this variable: ‘unexpected rate’). Finally we computed the rate of the time spent in unexpected activities over the total amount of daily activities time (we named this variable: ‘unexpected time rate’). To give an example, the diary in figure 1 would provide the following values: number of tasks = 6; unexpected tasks = 3; expected/unexpected switches = 4; unexpected rate = 50%; unexpected time rate = 41%).

3.3.3. Organizational Identification

To measure the strength of organizational identification we used the organizational identification scale proposed by Mael and Ashforth (1992) that consists of six items (see Appendix with the full scale). We asked respondents to indicate, on a 7-point Likert scale, the level of agreement with each item. The reliability of the scale as assessed by Cronbach’s alpha was 0.86.

3.3.4. Control variables

We controlled for organizational position, temporary/permanent employment, and organization. Individuals in higher organizational positions tend to engage in a higher number of activities and are expected to have higher levels of multitasking. In the R&D Unit position was coded as a three level variable (0= respondent does not supervise anyone; 1= respondent supervises some coworkers, 2= respondent is a formal manager of an organizational unit). This classification parallels that of the University Department, where position was coded as 0= PhD student/research assistant; 1= assistant professor, 2= tenured professor. Temporary workers in these organizations, as in many others, are hired to take care of a limited set of tasks in

specific projects, thus we expect that temporary workers will be less multitasking than permanent employees. We coded this variable, that we named 'permanent', as 1 = permanent; 0 = temporary. Finally, we controlled for the organization individuals belong to with a dummy variable (1 = R&D Unit and 0 = University Department).

3.4. Qualitative data analysis

We transcribed the interviews and the open questions in the diaries and coded them using the coding techniques suggested by Miles and Huberman (1994). Drawing on similar statements, we identified categories, i.e. 'recurrent themes', and we grouped convergent categories at a higher level of abstraction. We initially looked at specific themes derived from the literature, i.e. the ones incorporated in our theorizing (organizational polychronicity, multitasking, interruptions, attachment to the organization) and we added more themes as we continued with the analysis. An example of emergent theme was represented, for instance, by the values and temporal norms of the professional community. Another theme was represented by the different working spheres people worked on during a day. More specifically, we identified working spheres as proposed by González and Mark (2005). We combined two different data sources, that is the diaries of the people we interviewed and the transcribed interviews. First, individuals were aware that the diary part of the study regarded the different tasks they were working on the previous work day, thus they spontaneously offered details about work spheres when they wrote down the episodes in their diaries. Also the diary question related to the consequences of each episode helped us. In order to answer this question, individuals gave away pieces of information that led us to more clearly identify unrelated activities. A second source of information came from the specific questions we made during interviews or the

spontaneous comments informants made when they were asked to comment their diaries.

Finally, to look for support for, and explanation of, our hypotheses we also performed an axial coding (Strauss and Corbin, 1998) by connecting the categories. To enhance the reliability of our analysis, two of the authors met periodically to consolidate the coding book and to look for discrepancies in their interpretation of the data and reconciled disagreements through discussion.

4. Results

4.1. Hypothesis testing

Table 2 presents a comparison of means and standard deviations of variables in this study across the different organizational settings. Table 3 shows a correlation matrix and descriptive statistics for all the measured variables. Organizational Polychronicity positively correlates to position ($r = .24$, $p < 0,01$), number of tasks ($r = .27$, $p < 0,01$), unexpected tasks ($r = .31$, $p < 0,01$), expected/unexpected switches ($r = .24$, $p < 0,01$) and unexpected rate ($r = .25$, $p < 0,01$). It shows a negative correlation with organization ($r = -.19$, $p < 0,05$).

Insert Table 2 about here

Insert Table 3 about here

Table 4 reports the analyses for the relationship between Organizational Polychronicity and dependent variables and for the moderating effect of Organizational Identification. We used the variance inflation factor (VIF) to

assess multicollinearity. VIF scores were lower than 3.5, indicating that multicollinearity was not a problem. Hypotheses were tested via multiple regression analysis (Aiken and West, 1991). We tested Hypothesis 1, concerning the effect of Organizational Polychronicity on Multitasking Behaviors, by regressing outcomes on Organizational Polychronicity while controlling for organizational position, temporary/permanent employment, and organization (model 1). Hypothesis 2, concerning the moderating effect of Organizational Identification, was tested in a separate moderated regression model, specifically model 2.

Insert Table 4 about here

With regard to the control variables, position was significantly and positively related to three out of the five multitasking-behaviors variables (respectively number of tasks, unexpected tasks, and Expected/Unexpected switches) even though its effect weakened and became marginally significant on number of tasks when the moderating variable was entered. The variable Organization was significantly and positively related to all our dependent variables although its effect on the specific dependent variable number of tasks weakened and became only marginally significant when the moderating variable was entered.

Organizational Polychronicity showed to have a positive and significant effect on all Multitasking Behaviors. Specifically, Organizational Polychronicity has a positive and significant effect on number of tasks ($\beta = .54$, $p < 0.01$). Its effect on both unexpected tasks and Expected / Unexpected switches is also positive (respectively $\beta = .40$, $p < 0.001$ and $\beta = .30$, $p < 0.05$). Organizational

Polychronicity on both Unexpected Rate and Unexpected Time Rate is positive too (respectively $\beta = .06$, $p < 0.01$ and $\beta = .04$, $p < 0.05$). These findings prove that Hypothesis 1 is supported.

Table 4 shows moderating effects of Organizational Identification for each multitasking behavior in models 2. Contrary to our Hypothesis 2, Organizational Identification does not moderate the effect of Organizational Polychronicity on Multitasking Behaviors. In only one case, i.e. Number of Tasks, Organizational Identification shows to have a direct, positive and significant effect ($\beta = .40$, $p < 0.05$). Hypothesis 2 is, thus, not supported.

As above detailed, the Organization dummy variable is significant for all the multitasking variables. We performed an additional ANOVA analysis of the means' differences for each multitasking behavior measures across the two organizations (see Table 2). The results suggest that members in the R&D Unit and the University Department show a similar pattern regarding the average number of different activities they engage in a workday (i.e. Number of Tasks) and the number of times individuals move from expected to unexpected activities or viceversa (i.e. Expected/Unexpected switches). Even though the activities in the two contexts are different in nature, both organizations employ knowledge workers who are expected to conduct several tasks in a work day (for instance, in the R&D Unit, working on more than one project, and in the University Department doing research, teaching, interacting with stakeholders). This is consistent with the values on Organizational Polychronicity that show how in both contexts individuals perceived their organization to be polychronic above average (with the University Department showing a higher value than the

R&D Unit). However, employees in the University Department are significantly lower in terms of number of unexpected events that they attend during a workday (i.e. Unexpected Tasks), the rate of the number of unexpected activities over the total amount of daily activities (i.e. Unexpected Rate), and the rate of the time spent in unexpected activities over the total amount of daily activities time (i.e. Time Rate).

In addition, Table 2 shows that in both contexts individuals experienced high levels of identification. In both cases the mean organizational identification is above average, with the R&D Unit showing a higher value than the University Department. This can be traced back to the fact that the R&D Unit is a prestigious organization that, at time of study attracted attention from the media, the industry, and the financial markets.

Our qualitative data helped us to better understand those differences and the non significance of our second hypothesis.

4.2. Qualitative data analysis

The qualitative data we collected with interviews support our hypothesis testing and provide further explanations for our findings related to the interplay between organizational polychronicity and multitasking behavior and the direct effect of organizational identification on the number of tasks a person attends to in a day. Furthermore, our qualitative analysis underscores the role of the professional community. We comment upon these issues in the following paragraphs.

4.2.1. Organizational polychronicity and multitasking behaviors

The quantitative data on organizational polychronicity show that both in the R&D Unit and the University Department individuals perceive high levels of organizational polychronicity. This is reflected in the qualitative interviews we made with some members. For instance, in the R&D Unit individuals underline that theirs is an organization that requires them to work on many projects simultaneously. The fact that interactions with clients are initially managed by the commercial division, that rarely discusses projects acceptance with the R&D Unit, increases the need to carry out multiple projects at the same time. Both managers and employees perceive they are required high levels of multitasking between different projects. However, the different projects individuals are engaged in are similar in nature. In other words, the competences they put on each project are quite consistent across projects.

In the University Department, researchers are required to work on activities that are perceived to be, at times, dramatically different, as an associate professor underlines:

> Sometimes I feel I do many jobs at once. I am required to teach 120 hours a year. Plus I am vice chair of the department, which means I spend a lot of time in administration. Then… I need to produce excellent research, too! And all of this happens almost in every single day.

In some instances of our qualitative data informants made an explicit link between organizational polychronicity and multitasking. In the following field note an engineer in the R&D Unit underlines that a person who wants to work in an organization characterized by polychronic time preferences like his should adapt to that context and behave in a multitasking fashion.

> In this organization a person manages 270 million things, she begins something and leaves it there to begin another thing, and again she leaves it there, because there is an urgency and she needs to take a plane and fly to Croatia […] In my opinion, a person in my organization needs to deal with different contexts and if she does not like that and gets desperate because she needs to move between different activities, well, I think she would better change job! I think that you need to adapt to the specific context.

4.2.2. The effect of organizational identification on multitasking behaviors

Our quantitative analysis does not support the moderating role of organizational identification on the relationship between organizational polychronicity and multitasking. However, our qualitative data supports the finding that organizational identification may have a direct effect on the amount of activities individuals are willing to undertake in one single day. For instance, a manager in the R&D Unit, when commenting upon his extreme multitasking behavior, told us

> It is not a matter of individual preference. I simply know what are the things that my organization needs and the things that are not needed. Doing many things means helping and avoiding problems. I don't like interrupting what I am doing to go and help in the laboratory, like sweeping the floor or assess the weight of a component on a scale… But if it is needed I do it, because I care.

Similarly, in the University Department an assistant professor commented that she felt so obliged to her organization that she thought she should do many extra-role activities. These additional activities engendered her multitasking behaviors in such a way that, in some occasions, she considered them detrimental to her performance.

> I feel obliged to this organization. I feel I have to do all that I can to help. This means taking charge of many things I am not formally required to attend. For instance, the Department asks me to manage the master theses of three students a year… but by the end of January I have already taken care of five! And this happens together with my research and other teaching duties…

Some of our informants in both organizations mentioned that, while doing many activities was fine, the amount of disruption generated by switching away from tasks especially when unexpected was acceptable only to a certain extent. For instance, an assistant professor mentioned the importance of doing many things, but being in control by giving us the example of how she manages her agenda.

> Yes, I need to do many things, but I don't want that things happen to me completely random. This is what I do. I have a paper agenda on my table and every two months I write down what I have to do. I fill in when I want to work on an article, when I teach, when I am in the department meetings. And I leave blank spaces to fill in with everything that is unexpected. I know the unexpected will come, but I want to be prepared.

It is interesting to note that, as suggested by the field note above, during our interviews informants commented upon the difficulties of switching between expected and unexpected tasks in their agendas, but did not mention the disruptive effects of micro-interruptions, such as a temporary and brief change in task focus due to a phone call. On top of this, on diaries, actors were invited to indicate as many as possible tasks and events and interactive activities they attended to during the previous work day, according to a chronological pattern, but from an analysis of the diaries we could derive that the minimum time length reported in both sites for tasks and interactive activities was 10 minutes. While we are aware that even very brief interruptions (up to some seconds) can occupy cognitive resources and have an effect on people's work, our informants in recollecting their work experience did not record or comment upon them. Stated differently, in the organizations we studied it was the more macro switches between activities, in particular when unplanned, that generated feelings of confusion and overload and triggered the need of being in control and 'managing the unexpected'. In addition, when we discussed the qualitative data of the diaries with the people we interviewed, we found that in the diaries of the interviewed University Department members on average 92% of the switches between activities involved

moving from one context or sphere to a different one (62% in diaries of the interviewed R&D unit members). The switching between different spheres probably reinforces the perception that the unexpectedness of the switch is associated to high individual cognitive demands.

4.2.3. Beyond the organizational context: the professional community and multitasking

Even if not hypothesized in our initial theorizing, during interviews our informants often mentioned not only the requirements in terms of multitasking by their organization, but also the multitasking behaviors typical in their professional community. For instance, in the R&D Unit an engineer told us that he perceived that his multitasking behaviors were associated to the acquisition of diversified pieces of knowledge coming from different activities, that allowed him to become a better professional.

> I would define myself as a very specialized engineer, dedicated to innovation, who is motivated to find and develop new technologies […] Acquiring new knowledge also means that it's important that you work in different projects. I work on many projects now. Today I did the [client company name 1] engine, I worked on the [client company name 2] stuff, and I also went to a couple of meetings.

Similarly, in the University Department a few informants mentioned that their behaviors were driven by how their professional community values their willingness and ability to move efficiently between different tasks and activities. For instance a full professor told us:

> In order to build an excellent academic cv in Management you need not only to prove that you can do good research and good teaching. You also need to show that you do service for your organization and for your community. For instance you should help organizing conferences, being a reviewer, being in an editorial board, being involved in extra activities for

your department, find research funds... Of course, this means you need to be a very good multitasker!

5. Discussion

5.1. Contributions

Our mixed method study on the antecedents of multitasking behaviors in the workplace has shown that the extent to which individuals perceive that their organization values the involvement of members in multiple activities at a time (i.e. organizational polychronicity) directly influences their actual multitasking behaviors. Our work adds to the emerging literature in human computer studies that tries to explain how the organizational features influence individual multitasking behaviors in the workplace (e.g. Dabbish et al., 2011; Harr and Kaptelinin, 2007; Mark et al., 2005). Specifically we pay attention to one of the aspects of the organizational temporal norms that, as elements of the organizational culture, are able to impose certain structures on the professionals' work days. Previous literature on time management in organizations has shown some of the variables related to organizational polychronicity in the workplace (e.g. Arndt et al., 2006; Cotte and Ratneshwar, 1999), but has argued that more work was needed to better explain the interplay between individual perceptions about the organization and actual individual behaviors in the workplace related to time (Slocombe and Bluedorn, 1999; Zhang et al., 2005). Our work contributes to this line of research, too.

Our qualitative evidence corroborates and extends our quantitative analysis on the relationship between organizational polychronicity and multitasking. Specifically our qualitative evidence details how individuals perceive that their organization values them to be involved in many different projects (in the R&D Unit) and heterogeneous

activities (in the University Department) and how this actually drives their behaviors. However, our qualitative analysis also suggests a difference between the two contexts. In the R&D Unit of a company, where individuals are asked to work in projects that, although different, are all related to the development of mechatronic devices and involve similar skills individuals feel they have to adapt to the organizational style and that this can be a learning experience. In the University context, on the other hand, the activities individuals are asked to work simultaneously on are experienced as so heterogeneous that individuals often feel overwhelmed. Recalling Mark and colleagues' concept of working spheres, our qualitative data analysis suggests that the difference between working spheres associated to the work in the two contexts varies and it is smaller in the mechatronic R&D Unit as compared to the university context (Mark et al., 2005).

As for the role of the members' attachment toward their organization, we proposed the role of organizational identification in moderating the relationship between organizational polychronicity and multitasking behaviors, but our hypothesis was not supported. However, our quantitative findings suggest that the individual identification with the organization is directly related to how many activities a person is willing to undertake in one single day. We also find that organizational identification is not related to the number of switching to unexpected activities a person is willing to undertake, the sequencing of a person' activities into clearly separated 'chunks' of expected work and unexpected work, the rate of the number of unexpected activities over the total amount of daily activities, and the rate of the time spent in unexpected activities over the total amount of daily activities time.

How can we make sense of this quantitative finding? Consistent with previous research that informs us about how high levels of organizational identification are

positively related to extra-role and discretionary behaviors (e.g. O'Reilly and Chatman, 1986, Dutton et al., 1994, Dukerich et al., 2002), our qualitative evidence supports the idea that a high identifier is willing to take extra load in terms of number of projects and/or activities (i.e. she is willing to work on A, B, and C on one single day if doing so helps achieve organizational goals), but she does not accept passively how these activities are divided in one day. In other words, doing many things does not imply not being in control and moving around between activities without a plan, driven by continuous accidental interruptions. For instance, a person who does three activities in a day could switch between activities only two times a day (from A to B and from B to C) or could be continuously driven by interruptions and move between A, B and C many times a day, a multitasking behavior -this latter- described by our informants as detrimental for them and their organization. The behaviors described by our high identifiers are also consistent with González and Mark's (2004) evidence, where people actively employed strategies to cope with the unpredictability of the environment and to maintain continuity as much as possible even in a strongly multitasking environment.

Finally, our qualitative evidence suggests that not only organizational polychronicity matters, but also the way an individual perceives the time orientation of his/her profession is important. Some scholars (e.g. Bluedorn, 2002) have started to underline that jobs may differ in terms of their polychronicity orientation and some research explored the role of the job-level polychronicity, especially in relation to individual preferences for time management, in influencing work outcomes such as job satisfaction and well being (e.g. Hecht and Allen, 2005). We add to this stream of literature by suggesting to extend the understanding of the context characteristics on multitasking from the close organizational features to the work context at large. The

work context includes both the organizational and the professional community or communities (e.g. communities of practices, network of practices, professional communities, e.g. Tagliaventi and Mattarelli, 2006; Tagliaventi et al., 2010) an individual belongs to. We thus propose to extend the concept of organizational polychronicity to work polychronicity.

5.2. Limitations and future research directions

Our findings and future research should be considered in light of the study's limitations. Even if we developed a profound understanding of the dynamics underlining professionals' time management dynamics thanks to the variety of data sources that we used, and the methods and general principles underlining our approach may be generalizable, we have to acknowledge that our two organizations present differing features in terms of industry, structure, objectives, and that the results may not be comparable. Future studies could take organizational differences into account in the research design. For instance, the R&D Unit is a context much more formalized compared to an academic setting and therefore the organizational demands may be perceived as more constraining making individuals more willing to enact behaviors consistent with those demands. To give an example, there are significant differences in relation to the professionals' career paths in the two contexts. In a private company like the R&D unit, career progressions and advancements are proposed by supervisors and unit managers who influence, through their management decisions, also the organizations' temporal norms and preferences. To gain and maintain managers' support and sponsorship and to receive positive evaluations, people can be more willing to enact behaviors consistent with their perceived organizational preferences. While organizational and peer support as well as fit are important also in a university department, career progressions in academia are defined

at the institution committee level and directly related to the accomplishment, at specific temporal milestones, of specific performance results (e.g. a certain number of top tier publications, satisfactory evaluations in students' courses) that can be attained through many different behavioral strategies enacted by academics. In this latter case, the achievement of positive outcomes may be perceived as less connected to behaviors consistent with temporal organizational preferences.

Also, the strength of work interdependence – and the subsequent influence on multitasking – characterizing a group of engineers who work in a project-based organization is higher as compared to academic researchers who are probably less dependent on others to complete many work activities. Future research would therefore benefit from an analysis that includes also the extent to which activities are carried out collaboratively by more people as this could influence the level of multitasking.

In addition, we controlled for some individual differences that extant literature suggests could influence the individual multitasking behaviors (for instance organizational position). However, we did not include in our theorizing and analysis time-related individual differences such as, for instance, time urgency or individual polychronicity that recently has been related to individual differences in control strategy and control performance in process control domain (e.g. Luximon and Goonetilleke, 2012; Zhang et al., 2005). We believe that future studies could greatly benefit from an investigation of the interplay between perceived temporal organizational norms and individual time-related differences. In particular, it would be particularly insightful to explore what happens when individual and organizational preferences for managing time are not aligned.

In this study we focused on multitasking between activities and we did not make specific theoretical predictions on switching contexts or working spheres. However, we know that it is more cognitively demanding to move between an activity in one context to an activity in a different context than moving between two different activities but within the same context (e.g. González and Mark, 2005; LePine et al., 2000) and this was supported by our qualitative evidence. However, it could be useful to explicitly focus the analysis on the organizational antecedents and consequences of switching between different contexts. We leave this to future research.

The focus of our work has been on sequential multitasking (Salvucci and Taatgen, 2011). Of course, we recognize that also concurrent multitasking and micro-level switching are relevant in organizations, but, given, on the one hand, the intrinsically different methodological premises for collecting micro and macro data on multitasking and, on the other hand, our empirical evidence that suggests that individuals in the two organizations were mainly concerned with macro-task switching, we only dealt with sequential multitasking at the rational band level. Future research could investigate the influence of the organizational context on concurrent multitasking at different band levels. For instance, how do the characteristics (e.g. temporal norms) of the organizations as perceived by individuals influence the practices related to the use of multiple technologies in the workplace, for instance the acceptability of using the phone and the IM during a meeting?

In relation to this, we should also underline that our work did not specifically focus on interruptions. The investigation of the interplay between processes related to interruptions and organizational variables is a promising avenue of research. For instance, in our study we investigate the individuals' transition from one activity to another during their workday, but we do not focus on how individuals are interrupted

and may negotiate with others these transitions (e.g. ignore some of the interruptions, handle them quickly, or delay them). The negotiation of transitions reflects the management process of 'if' and 'when' the interrupted individual should begin an activity different from the one he/she is currently engaged with. Previous studies, such as Wiberg and Whittaker (2005) have shown the importance of negotiating availability during the transition from one task to another. We believe that understanding how the organizational context impacts on negotiations and transitions between tasks would be of theoretical and practical relevance.

As for practical contributions, this work suggests two main managerial implications. First, managers should be aware that individuals develop perceptions of the time orientation of their organization and that this drives their behaviors. Thus, managers should be sure that everyone is on the same page and interprets organizational requirements in a way that is conductive to better organizational outcomes. For instance managers should promote a 'time use etiquette' or give instructions about the use of ICTs in terms of time issues, or promote a common behavior etiquette in relation to how to deal with deadlines in projects (e.g. when is it acceptable to immediately attend a request from a colleague and when is it not?). Second, managers should clarify that the organizational identity comprises certain values related to time management, so that high identifiers actually comply with those values. Thus, they should actively communicate their employees the time related values of their organization.

5.3. Methodological reflections

Our work offers specific reflections on how to conduct multi-methods studies on multitasking in organizational contexts. Specifically, we made use of a survey, diaries, and interviews. Our aim for using multiple methods was first and foremost to develop

a more nuanced and profound understanding of the way professionals experienced their work context and the influence on their behaviors. Table 5 summarizes the main advantages and challenges of each method and how we tried to address them in this study.

Insert Table 5 about here

Surveys are an excellent tool to collect the perceptions of individuals in relation to time management issues and their attitudes towards, and perceptions of, their organization (e.g. Fowler, 2009) and they have been extensively used in time management literature (e.g. Slocombe and Bluedorn, 1999; Souitaris and Maestro, 2010). More specifically, we used a survey to collect perceptions of organizational polychronicity and organizational identification, using established scales from the literature (Bluedorn et al., 1992; Mael and Asforth, 1992). Of course, survey data do not represent adequately the complexity of the organizations and of individual behaviors in social contexts. To be able to grasp, in our informants' words, the complexity entailed in modern organizations we also collected data with diaries and interviews.

Diaries are an interesting, though relatively underused, tool for doing research (Symon and Cassel, 1998) and collecting time use data. They consist of a log of the sequence and duration of activities (or 'episodes') engaged in by an individual over a specific period (Converse, 1968). An advantage of time diaries is the possibility of collecting contextual data together with subjective data (such as individual satisfaction or perception of usefulness) (Harvey and Pentland, 2002). For instance Perlow (1999) adopted an open-format response style to analyze the use of time at

work by a group of software engineers in a high tech corporation. Others scholars have adopted a more structured format like a checklist of individuals' daily activities (Carlson, 1951) or a combination of closed questions and open-ended sections (Czerwinski et al., 2004; Hess and Wulf, 2009). Nevertheless, as Mintzberg (1973) stated, a completely structured format pointlessly constrains the research material that can be gathered.

Our format for diaries that includes both structured and open questions (see Figure 1 for an example), has, of course limitations. Given the time required to fill in the log, informants perceive it as intrusive and time consuming. In order to partially address this issue, as we detailed in the methodology section, we obtained formal support from the organizations and engaged our informants in our research. Moreover, we asked them to fill in only one day of work. Specifically, we asked them to recall the previous days' activities so that on the one hand events were relatively close in time and, on the other hand, they did not have to interrupt their regular activities while they were doing them in order to fill in the log. Another problem pertains to the fact that different informants provide information with different levels of details. We understand that this is a limitation that we cannot overcome, but, in order to interpret and contextualize differences, we complemented diaries with semi-structured interviews.

During interviews we asked our informant to comment upon their diaries and we tried to develop a rich comprehension of the context and how individuals worked in practice. Not only interviews allowed us to triangulate our quantitative findings, but they also allowed to extend our theorizing. Of course, doing research interviews is an 'art' that needs to be mastered (Fontana and Frey, 2003). A problem that we recurrently face as interviewers when we talk with knowledge professionals is the

need for our informants to give their own meta-interpretation of events and activities and, sometimes, their desire to conform to social desirable thinking and behaviors. For instance, in a fast pace time like ours, it seems absurd to say you like to work on one single task at a time! In order to deal with these issues we followed the best practices for interviewing (e.g. Gubrium and Holstein, 2003; Spradley, 1979) and availed ourselves of the extensive experience we gained on the field with qualitative research (e.g. missing reference for review process).

6. Conclusion

The current research contributes to the literature on multitasking furthering our understanding of how features of the organizational context, and in particular perceived organizational polychronicity, influence multitasking behaviors. We thus add to the literature that shows how the individuals' choices in terms of multitasking behaviors are socially embedded, above and beyond individual preferences and the nature of the tasks. As knowledge intensive firms rely more and more on new forms of work organization that increase the extent to which their members are engaged simultaneously on several projects, teams or activities, we argue that an enhanced comprehension of the factors that may influence the patterns of multitasking and interruptive behaviors has the potential to improve not only our theorizing as researchers but also the effectiveness of every organizational intervention aimed at helping people to manage effectively their tasks.

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Appendix: Scales used to measure variables.

Organizational Polychronicity (Bluedorn et al., 1992)

In [the R&D Unit/University Department] we like to juggle several activities at the same time.

In [the R&D Unit/University Department] we would rather complete an entire activity everyday than complete parts of several activities. (Reverse-scored)

In [the R&D Unit/University Department] we believe people should try do many activities at once.

In [the R&D Unit/University Department] when we work by ourselves we usually work on one activity at a time. (Reverse-scored)

In [the R&D Unit/University Department] we prefer to do one activity at a time. (Reverse-scored)

Identification with the Organization (Mael and Ashforth, 1992)

When someone criticizes [the R&D Unit/University Department], it feels like a personal insult.

I am very interested in what others think about [the R&D Unit/University Department].

When I talk about [the R&D Unit/University Department], I usually say ‘we’ rather than ‘they’.

Successes of [the R&D Unit/University Department] are my successes.

When someone praises [the R&D Unit/University Department], it feels like a personal compliment.

If a story in the media criticized [the R&D Unit/University Department], I would feel embarrassed.

Figure 1: Example of diary

How did you use your time in your last working day? Please, in the following diary-table report:
- The activities and tasks (episodes) you were engaged in (specify with whom you interacted with, if applicable);
- The episode's duration;
- If the episode was expected (for example, it was scheduled in your agenda) or not expected;
- The episode's effect on your future work activities (e.g.: "better comprehension of a technical problem", "need to reschedule my agenda for next two weeks")

	Episode	Duration (HH-MM)	Expected (E)/ Unexpected (U)	Effects
Morning	Meeting about the commercialization of a dedicated PC.	03-00	E X U ☐	I needed to reorganize my agenda for two weeks.
	Phone call with a software supplier in order to define the delivery timing of the product and to discuss how to implement foreseen changes.	01-10	E ☐ U X	I gained information necessary for future project choices.
Afternoon	Definition of palmtop software specs to customize specific OEM car type.	00-45	E X U ☐	No effects.
	Solution of specific problems which happened on some firm PCs and related to the installation of the calibration software ECU.	01-30	E ☐ U X	Delay in planned activities.
	Meeting to discuss release timing for a new software version.	01-00	E ☐ U X	I gained information necessary to reorganize my current day.
	New software version testing.	01-30	E X U ☐	Deeper knowledge of the product.

Did your last working day's schedule reflect your typical workday?

X Yes ☐ No

If not, why?

……

Table 1: A synthesis of the literature review on the organizational antecedents and consequences of multitasking behaviors in the workplace

Multitasking behaviors in the workplace	
Antecedents	**Consequences**
Formal and emergent interactions with coworkers Requests and need for attention (e.g., Gonzalez and Mark, 2004; Harr and Kaptelinin, 2007) *Physical office layout and location* Open office vs traditional office layouts and interruptions (Dabbish et al., 2011; Fayard and Weeks, 2012) Location characteristics and interruptions (Harr and Kaptelinin, 2012; Whittaker et al., 1994) *Work allocation and organizational design* Multiple team membership (O'Leary et al., 2011) Flat organizational structures (Appelbaum et al., 2008) *Intense use of collaborative technology* Use of instant messaging and other collaborative technology (e.g., Bertolotti et al, 2012; Li et al., 2011) *Organizational norms* Organizational norms regarding time use (Perlow, 1999) *Individual perceptions and attitudes about the organization* ? – our focus	*Individual level* Delayed completion of tasks, higher frequency of errors, lower ability to think creatively, worse decision making (e.g., Appelbaum et al., 2008; Gendreau, 2007) Beneficial effects when switching within the same working sphere, e.g. more reflection on one task, negative when switching between different working spheres, e.g., redundant work (Mark et al., 2005) *Team level* Reduced team productivity and performance when individuals are engaged in too many teams simultaneously (O'Leary et al., 2011; Bertolotti et al., 2012) Increased knowledge sharing within and between work teams (e.g., Bertolotti et al., 2012; O'Leary et al., 2011; Zellmer-Bruhn, 2003) *Organizational level* Reduced overall organizational performance, e.g. innovativeness when 'vicious cycles' emerge (Perlow, 1999) Difficulties in coordination across projects (Mortensen et al., 2007; O'Leary et al., 2009) Improved resource utilization and knowledge sharing (O'Leary et al., 2009)

Table 2: Means differences across organizations

	Multitasking behaviors					Organizational Polychronicity	Organizational Identification
Organization	Number of tasks	Unexpected Tasks	Expected / Unexpected switches	Unexpected Rate	Unexpected Time Rate		
Engineering Department	4,22 (2,11)	0,98 (0,91)	1,35 (1,37)	0,22 (0,18)	0,10 (0,12)	5,03 (0,92)	5,06 (0,98)
R&D Unit	4,48 (2,33)	1,73 (1,66)	1,48 (1,71)	0,36 (0,31)	0,32 (0,31)	4,61 (1,28)	5,61 (0,86)
F statistic	F(1,120) = 0,41	F(1,115) = 8,39**	F(1,114) = 0,18	F(1,114) = 8,34**	F(1,107) = 24,11***	F(1,129) = 4,66*	F(1,129) = 11,75***

Standard deviations are in parentheses.
* $p < 0,05$
** $p < 0,01$
*** $p < 0,001$

Table 3. Descriptives and Correlations

	Variable	Mean	S.D.	N	1	2	3	4	5	6	7	8	9	10
1	Position	0,59	0,78	134										
2	Permanent	0,80	0,40	131	0,38**									
3	Organization	0,52	0,50	134	-0,35**	0,53**								
4	Organizational Polychronicity	4,82	1,13	131	0,24**	0,02	-0,19*							
5	Organizational Identification	5,35	0,96	131	-0,09	0,17*	0,29**	-0,06						
6	Number of tasks	4,36	2,23	122	0,16	0,12	0,06	0,27**	0,18*					
7	Unexpected Tasks	1,40	1,43	117	0,09	0,21*	0,26**	0,31**	0,13	0,69**				
8	Expected / Unexpected switches	1,42	1,56	116	0,20*	0,09	0,04	0,24**	0,10	0,77**	0,75**			
9	Unexpected Rate	0,30	0,27	116	0,02	0,18	0,26**	0,25**	0,11	0,20*	0,74**	0,39**		
10	Unexpected Time Rate	0,22	0,26	109	-0,04	0,28**	0,43**	0,11	0,22*	0,20*	0,67**	0,28**	0,88**	

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4. Results of hierarchical regression analysis

	Number of tasks		**Unexpected Tasks**		**Expected / Unexpected switches**		**Unexpected Rate**		**Unexpected Time Rate**	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
(Constant)	3,81***	3,91***	0,73*	0,74*	1,10**	1,14**	0,19***	0,20***	0,06	0,07
Position	0,77*	0,72†	0,54*	0,55*	0,77**	0,76**	0,06	0,07	0,06	0,06
Permanent	-0,78	-0,73	-0,66	-0,69	-0,96	-0,96	-0,08	-0,09	-0,05	-0,06
Organization	1,39*	1,13†	1,61***	1,63***	1,20*	1,13*	0,25**	0,26**	0,31***	0,31***
Organizational Polychronicity	0,54**	0,50**	0,40***	0,41***	0,30*	0,29*	0,06**	0,07**	0,04*	0,04*
Organizational Identification		0,40*		-0,04		0,14		-0,02		0,00
Org.Poly. * Org.Ident.		0,11		-0,06		0,08		-0,03		-0,03
DR2		0,02		0,00		0,00		0,00		0,00
Overall R2	0,14	0,16	0,25	0,25	0,13	0,13	0,18	0,18	0,25	0,25
df	4-114	6-112	4-109	6-107	4-108	6-106	4-108	6-106	4-101	6-99
Overall F	4,44**	3,57**	8,92***	5,90***	3,96**	2,76*	5,82***	4,19***	8,57***	5,98***

† p < 0,1
* p < 0,05
** p < 0,01
*** p < 0,001

Table 5. The advantages and challenges of mixing methods in the study of the interplay between individuals' perceptions of organizations and multitasking

	Advantages	**Challenges**	**Tactics we used to mitigate challenges**
Survey	Measurement of individual perceptions and attitudes related to the organization	• Survey data do not represent adequately the complexity of the organization and of individual behaviors	• We complemented the survey with other methods
Diaries	Measurement of actual multitasking behaviors	• Perceived as intrusive and time consuming by respondents (e.g., they need to stop working to fill in the diary) • Respondents use different granularity when recollecting their activities • Respondents detail their responses differently	• We made a presentation to informants before the beginning of the project • We collected only one day logs • We asked informants to recollect the previous day of work • We complemented diaries with interviews
Interviews	Individual account of how work is conducted	• Individuals may describe social desirable behaviors • Individuals may try to provide us with their own meta-interpretation of the world, instead of recounting their experiences	• Used best practice to conduct semi-structured interviews