Framing multitasking:
practices, experiences and negotiations of multitasking in spatio-temporalities of everyday life

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Abstract

To date, multitasking is found to occur in a wide variety of situational settings and argued to involve different implications for individuals. Nonetheless, there is a lack of a sound theoretical understanding of the complexities involved in multitasking. Therefore, the aim of this study is to provide insight into the spatio-temporalities of multitasking and people's experiences and negotiations of multitasking practices. This study draws on the concept of attention and a relational approach to emphasize multitasking is a process embedded by the interaction of individuals and the environment. Empirically supported by qualitative data, this study shows multitasking is performed in different spatiotemporal situations and involves different activity combinations. People's varying experiences stem from these performances and the complexities at play in multitasking practices. In response to their experiences of activity performances and lived time, people employ several strategies to negotiate multitasking.

Key words: multitasking, space-time, attention, strategies, urban

1 Introduction

Multitasking has been investigated since the pre-Internet era, recognizing the wide range of activities which can be combined, such as talking while cooking or eating while watching television (Szelai, 1972). Multitasking is a process in which multiple activities are performed simultaneously and therefore it is often considered a manner to deal with time-pressure. Due to structural societal changes in employment, especially of women entering the labour market and increasing individualisation of societies, time-pressure is increasingly prevalent amongst a large amount of people in western societies (Sullivan, 2008). Accordingly, multitasking has been shown to occur particularly amongst those with full time-schedules, such as dual-income households with children in which multiple responsibilities of paid work and childcare are combined (Bittman and Wajcman, 2000; Southerton, 2006; Sullivan, 2008). Indeed, studies have demonstrated that people combine activities in different situations, such as in work, travel, interpersonal communications and domestic activities (Baron, 2005; Gonzales & Mark, 2004; Kenyon & Lyons, 2007; Ohomori and Harata, 2008; Zacarias et al, 2006). Additionally, there has been a growth of opportunities in which people can perform multitasking because of increasing flexibility of social practices in daily life (Wajcman, 2008). The widespread penetration of Information and Communication Technologies (ICTs) has enabled the performance of a multitude of activities at different times and places (Couclelis, 2004). Furthermore, institutional settings increasingly support people's flexible life styles, for instance by employing longer opening hours of stores and buildings, online access to goods and services, or

allowing flexibility for employees to plan their work activities in less strict times and places (Appelbaum et al, 2008).

Furthermore, the phenomenon of multitasking is gaining relevance considering social life will more and more take place in urban environments. By the year 2070 approximately 70 percent of the world population will live in cities (United Nations, 2008). City life is accompanied with a high amount of unexpected heterogeneous impressions stemming from urban environments and these many different settings, stimuli and tasks draw on the human capability to direct attention of the individual (Geller, 1980; Kuo, 2001). Hence, urban environments are argued to come with manifold opportunities to engage in all kinds of activities (Kuo, 2001). These many impressions inciting activity may thereby affect people's mental states, for instance, their emotional well-being and stress processing (e.g. Fleming et al., 1987; Lederbogen et al, 2011). Likewise, multitasking is often debated for its implications: whereas some see multitasking as a means to 'save time', associated with efficiency and productivity, others discuss implications regarding stress processing and the well-being of individuals (Baron, 2005; Floro & Miles, 2003; Gasser and Palfrey, 2009; Kenyon & Lyons, 2007). Because of this broadening of spatio-temporal settings in which opportunities for multitasking occur and the supposed implications involved, it can be expected that multitasking will have considerable impacts on the lives of individuals.

Nonetheless, the body of knowledge on multitasking thus far has been unable to grasp its complexity: it remains unclear what exactly multitasking is and how it works. One of the questions remaining unanswered is how tasks or activities are to be understood, whilst this is crucial in understanding under which conditions we speak of multitasking. The concept of *attention* in this respect is an interesting starting point; it is mentioned by different authors in relation to multitasking, yet not investigated in depth (e.g. Kenyon & Lyons, 2007; Gasser and Palfrey, 2009). Attention is something that can be drawn by events and entities in the environment; this indicates activities are not only purposefully engaged in, but also happen outside of an individual's intentions. Multitasking then should be understood in relation to its environmental context, something up till now modestly done in research on multitasking (e.g. Ohomori & Harata, 2008). Secondly, although widely discussed for its implications, it is not clear why people multitask and how people's experiences and negotiations of multitasking come about. Understanding this can result in useful starting points for policy makers in different respects, such as the guidance of people's behaviour or the design of (semi-)public spaces and working environments. The aim of this study, therefore, is *to provide insight into the spatio-temporalities of multitasking and people's experiences and negotiations of multitasking practices.*

This uses a relational approach in order to investigate the role of time-spaces as 'active presence' (Murdoch, 2006, p. 15) in embedding multitasking practices. Placing multitasking in its spatio-temporal context facilitates a more complete understanding of the phenomenon and of how people's experiences of multitasking and negotiations to avoid, support or alter multitasking practices come about. These aspects are elaborated in the theoretical framework in section 2. In order to empirically support this framework, qualitative research methods are used (section 3). Before starting this study, an exploration was made of the occurrence of activity combination by analysing secondary quantitative data from a time-budget study of

over 3,000 respondents' primary, secondary and tertiary activities (SCP, 2005). This analysis showed a weak correlation between multitasking and socio-demographic characteristics and urbanization rate. However, the variables included did not account for the occurrence of multitasking. This study uses time-budget diaries and follow-up interviews amongst dual-income households with children from medium-sized cities in the Netherlands. The results from the data analysis are presented in section 4. The final section addresses the conclusion and points for discussion and future research.

2 Framing multitasking

The concept of multitasking is used amongst different disciplines, such as computer science, management, gender and transport studies. Within these disciplines different understandings of multitasking are used, but they have in common their emphasis on multitasking as occurring in absolute time and absolute or contained space. In an absolute framework, time and space are considered fixed entities: events can be planned within the frame of absolute time and space and these times and spaces can be measured and calculated with (Harvey, 2007). The relationship between time and activities is central in these understandings; little emphasis is put on the notion of space. However, as argued by Harvey (2007) time and space cannot be considered independent from each other. Consequently, to understand multitasking, we have to understand it in its spatio-temporal context.

In absolute approaches, multitasking is understood in two manners, namely as parallel processing or as task switching (Carrier et al, 2009). Parallel processing refers to the performance of multiple activities at the exact same moment, whereas task switching entails the continuous switching of attention between multiple activities during a time period. Since neuroscientists argue people are simply incapable of parallel processing, this latter understanding of the relationship between activity performance and time is largely used in existing studies (Salvucci and Taatgen, 2008). Accordingly, multitasking is often investigated by observing the combination of multiple activities in a particular time span, ranging from five minute-intervals, to thirty minute and hourly intervals (Bittman and Wajcman, 2000; Carrier et al, 2009). However, whether multitasking occurs then is largely implicated in the time-interval chosen: too short intervals may leave a lot of multitasking practices hidden, whereas too long intervals may include too many activities. Also, from these time intervals it may be hard to establish whether activities are performed simultaneously or sequentially.

Furthermore, from an absolute perspective, multitasking shows resemblance with activity fragmentation. Activity fragmentation refers to a process in which activities are broken up in sub-tasks and performed at different times and/or locations, such as in store shopping, which can be broken up in desire, information gathering/receiving, purchase, delivery, evaluation (Couclelis, 2004; Hubers et al, 2008; Mokhtarian, 2004). However, in multitasking it are not only neatly defined (sub-)activities that are of importance. Also, activities differ widely in nature, for instance, in terms of the time needed to fulfil an activity or amount of concentration and focus of an individual needed to perform it, also referred to as active attention (Kenyon & Lyons, 2007).

In order to take this wide variety of activities into account, this study considers anything that an individual directs attention to an activity. By explaining how this directing of attention to activities works it becomes clear multitasking is better to be

understood as a relational process. Directing attention is an interactional process between individuals and their spatial context. Every second the human senses get a wealth of impulses from their environment. The brain selects particular impulses over others; this selection is known as the focus of attention (Pashler, 1999). Sensorial information can act upon the individual to such an extent as to eventually switch attention to the 'unattended', thereby drawing attention away from other activities (Näätänen, 1992). For instance, whilst reading this article, aural, visual, sensual, tactile or even gustative information from the surroundings or from the self that reaches your senses, such as an event outside your window, may draw your attention away from reading the article into observing this particular event. When attention is at observing the event outside the window, attention for the article has not disappeared completely, for the impulses at play in embedding attention and engagement in reading the article are still being processed: the paper and pen you were making comments with, or maybe the physical apparatus, light, buzzing and warmth transmitted by a computer displaying the article. Such sensorial impulses from the environmental context continuously act upon the individual and draw attention into activities thereby embedding multitasking practices.

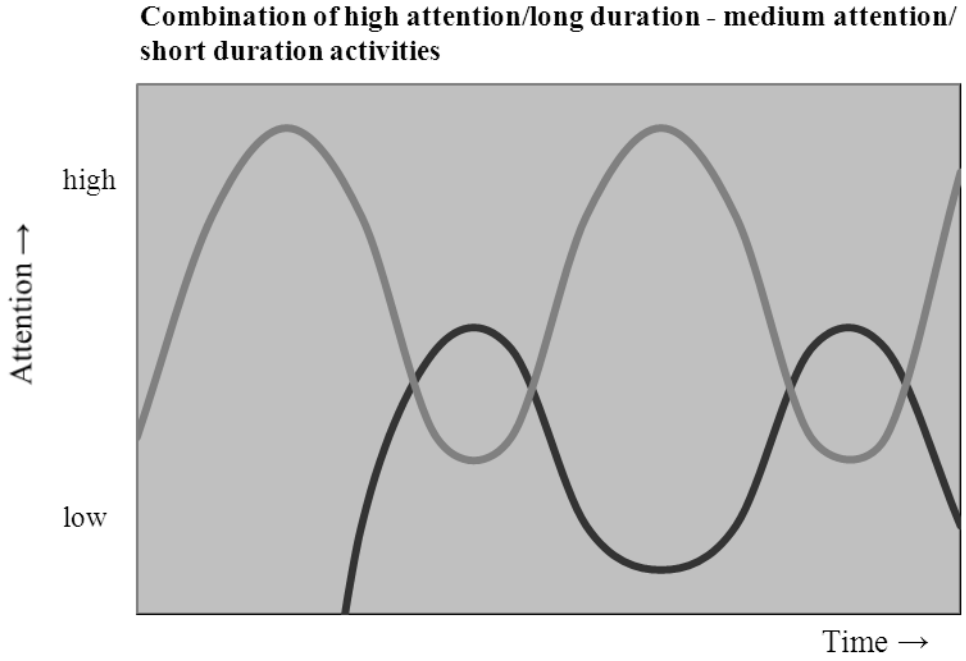
Multitasking, then, is to be understood as a relational process embedded by the interplay of different events, humans, objects and other non-human actors present in the environmental setting. Following a relational approach, action is embedded in (power) relations between different actors assembled in networks; different activities come with different networks of relations and thereby define their own spatial and temporal framework (Latour, 2005; Murdoch, 2006). Simultaneous enrolment in different networks of relations underlies the process in which attention is divided amongst these different activities, and multitasking is performed. Of importance here is the role of corporeal and sensorial engagement of the individual in the environment in embedding human acting. Because of this embodied presence of the individual in the situation, sensorial information encountered by the body in the shape of different actors is internalized and externalized in behaviour and body language (Williams & Bendelow, 1998). Embodied engagement thereby embeds enrolment of the individual in the networks of relations at play, thereby engaging in multitasking.

A relational approach follows a conceptualization of space as relational space, in which space and time do not exist by themselves, but stem from the processes that define them. Relational space involves different locales and temporalities, and space and time 'bend' in a relational understanding of space-time (Harvey, 2007). Although it has been suggested to make use of an understanding of time as 'non-linear (Kenyon & Lyons, 2007, p.173), no studies which use a relational approach in understanding multitasking are known by the author. Placing multitasking in a relational framework overcomes the difficulties of conceptualizing space and time as absolute: instead of only understanding space as physical, fixed and contained, it emphasizes the importance of perceived space and time. The different locales and temporalities connected in multitasking practices come together in the individual performing multiple activities; in this way, the individual gets a sense of an intensification of activity performance in limited time. Multitasking, then, becomes a subjective construct, for it is only from the individual's point of view that multitasking can be argued to occur. Multitasking, therefore, is defined as *the perceived simultaneous performance of multiple activities*.

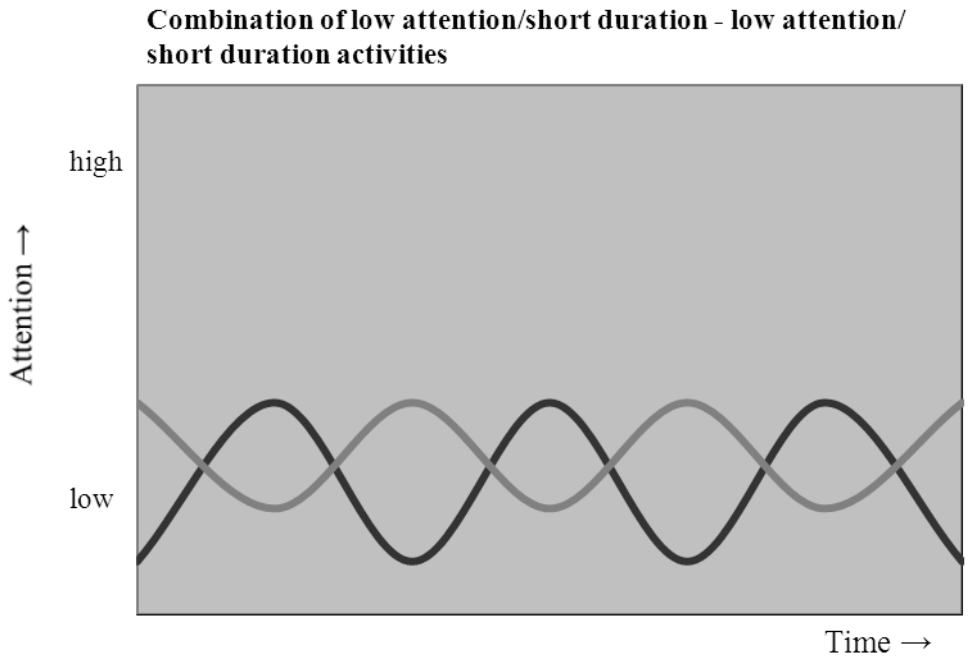
The relations between the performances of activities combined and the spatio-temporalities involved in multitasking practices come with particular experiences. To illustrate this, Figures 1(a-b) show two types of multitasking practices (A and B) in which different kinds of activities are involved and therefore are likely to follow different experiences each. In the graphs, the amount of attention the activities draw upon is reflected in the amplitude of the curves; the duration of the focus of attention of activities is reflected in the wavelength.

Figure 1

a. Type A Multitasking



b. Type B Multitasking



Source: own design

Imagine an individual engaged in making complex mathematical calculations (high attention/long duration) at home at the kitchen table and simultaneously being asked several questions by a housemate (medium attention/short duration) (Figure 1a). The curves in the graph show a redistribution of attention is taking place when attention is switched from calculating to responding to the housemate and vice versa, showing the person engaged in making calculations is questioned twice. In this situation, when one long high attention activity is 'interrupted' by a short lower attention activity, multitasking may be difficult to perform, because performing complex activities often requires the brain to keep information active while performing a task, such as making calculations (Salvucci and Taatgen, 2008). Consequently, the directing and re-directing of attention may cost effort. It is hypothesized that this performance of multitasking may therefore lead to experiences of annoyance or irritation, because the individual is hindered in performing the calculating activity. However, it is also hypothesized that others may find it a welcome distraction from the initial activity. Furthermore, it is expected that when multitasking is 'forced' upon and not purposefully engaged in it is experienced negatively.

Figure 1b shows a combination of short duration activities of lower attention. The curves show a fast and intensive alternation between activities is taking place. Experiences involved here are expected to stem from the attention necessary to perform the activities involved. When activities require less focus of attention and concentration of the individual, the performance of multitasking is likely to proceed more easily (Näätänen, 1992; Salvucci and Taatgen, 2008). For instance, domestic tasks are often performed automatically; similar to walking or talking (Pashler, 1999). Such activities follow particular scripts or action programs, episodic series of actions stemming from interaction with particular situations and entities (Heijs and Verbeek, 2006). It is expected that in case of such activities involved, dividing attention will go easier or, indeed, effortless, which may lead to feelings of satisfaction. However, when an activity emerges which suddenly requires high attention, the automaticity of performing the other activity is likely to be harder (Salvucci and Taatgen, 2008). In such instances, multitasking is hypothesized to involve negative experiences.

Individuals can also employ strategies in order to perform activities as they prefer (González & Mark, 2004). They can negotiate the power of different entities and thereby assemble or reassemble networks of relations embedding multitasking practices, according to their experiences. Positive experiences may lead to stimulation or continuation, whereas negative experiences may lead to temper, ignore or disengage in multitasking. These negotiations can be realised via different strategies. It is expected that one such a strategy is the negotiation of presence and absence of actors present in spatio-temporal situations, for example, by shutting the slats of blinds, by switching on or off electronic equipment, by hanging a sign on the door which says 'do not disturb'. A second strategy that is expected to occur is the planning of activities in terms of selecting particular spatio-temporalities in which to perform them. People are expected to select spatio-temporal situations characterized by particular sets of entities present and/or absent followed by a certain availability or lack of opportunities for engagement in multitasking. By usage of these two strategies people are expected to negotiate multitasking practices. These and other hypotheses stated are tested in empirical fieldwork.

3 Research design

The research population exists of men and women in the ages of 25 to 50 years old (n=17; nine men, eight women) who live in dual-income households with children. This criterion is based on the notion that pressure to combine multiple responsibilities of work and care is high amongst this socio-demographic group compared to other groups (SCP, 2005). The minimum hours of work of each breadwinner of the household is set to 20 hours a week. Furthermore, respondents included either worked or both lived and worked in a medium-sized city in the Netherlands, accounting for similarities in entities encountered in daily lives. Respondents were recruited by posting request notes in (semi-)public spaces and via word-of-mouth referrals.

The respondents are asked to fill in time-budget diaries during one of their regular working days (a weekday), at home or outside of their home. Respondents reported all activities for each 15-minute time interval during 24-hours, using a list of activities included in the diaries; respondents could also add activities which were not listed. Instead of a hierarchy in activities (primary, secondary, tertiary), commonly used in time-budget studies, they could randomly fill in all activities performed since identifying priorities in activities can be difficult (Salvucci and Taatgen, 2008). Respondents were instructed to write down activities in which they actively engaged in order to capture the activities which had their attention. For each time interval, they registered the location (at home, at work or at another location) as well as feelings of tension, in order to get a sense of their experiences, and the rate of concentration, in order to get an indication of the focus of attention for particular activities.

The data collected in the diaries was not aimed to be the main data, because from these diaries it cannot be established whether multitasking occurred. Instead, these data are used for giving depth to the interviews by referring to events and situations of respondent's own lives captured in the diaries. The interviews were given some structure by the interviewer who had decided beforehand which events were brought up for discussion; (groups of) intervals discussed were those in which multiple activities were reported, or which showed remarkable rates of concentration or tension. The events chosen functioned as topic list; apart from that, the interviews were conducted unstructured, leaving room for spontaneous interaction. Because of this unstructured nature, respondents themselves also brought up situations, not reported in the diary, in which they felt engaged in multitasking. Respondents were asked to give a description about the time interval concerned, and reflect on their feelings associated to it in order to find out whether multitasking had occurred and how they experienced this. It was addressed how it came to happen that the respondent got engaged in multitasking practices. Furthermore, negotiations of multitasking practices of respondents were addressed in discussing the diary as well as in scenarios described by the interviewer. In some cases, it was also discussed why respondents hardly reported multiple activities. The interviews lasted approximately one to one-and-half hours and were audio-taped and transcribed. The data was analyzed using MAXQDA. Initially interviews were coded for broad topics: multitasking practices, experiences and negotiations. Thereafter, coding proceeded more specifically on aspects of these broad topics recurring in multiple interviews. During the analyzing process, the coding system was evaluated and altered when necessary.

The ages of the respondents range from 31 to 46 years old. A variety of jobs is represented, both higher education and lower education ones, with different natures of working activities involved. Furthermore, the children of the respondents range from age 0 to age 15. Overall, the respondents enjoyed participating in the study. The original names of respondents are changed in fictive ones in the results section.

4 Results

Multitasking practices have shown to be interdependent with a wide range of entities from the social and material world. Relations assembled amongst these entities in different situational settings afford different performances of multitasking. To date, switching attention amongst different tasks or activities is highly prevalent in working environments (Appelbaum et al, 2008; González and Mark, 2004). Working environments are abundant in actors drawing attention: the ubiquitous presence of fixed technologies and mobile technologies, colleagues and other human actors afford a wide range of activities. Indeed, many instances of multitasking in working situations are reported, in which the performance of one long term activity is performed concurrent to different shorter activities of varying attention levels (type A multitasking), for instance when working on a document is combined with communication activities: phone calls, e-mails or colleagues walking in and out for consultation. Mary explains:

"I was working on an assessment, so that means working on a document [on a personal computer]. I got a phone call and then I closed down the document I was working on and went to look up another document which was discussed in the phone call […]. It was an official body which called, and I extensively told them the ins and the outs etcetera. So [I]immediately looked that up and afterwards shut it down again and continued my other task, which I then had to look up again. So all in all the phone conversation then cost me 20 minutes." - Mary (43)

These multitasking practices involve a series of operations performed related to the activities combined thereby transforming the spatial and temporal configurations. As Mary indicates, the process of multitasking encompasses quite some time and alters the time slot engaged in: after 20 minutes Mary is able to refocus and direct attention to the assessment again. Additionally, the spatial lay-out is (temporarily) altered, for particular documents are put away and others are looked up. Other respondents report moving to or between spaces, for instance, in order to look up documents or consult colleagues. These spatial and temporal reconfigurations are not always appreciated by the individual, for it may endanger or delay the performance of other activities. This incites feelings of hurriedness, especially with a particular scheduled time or event approaching.

As in Mary's example, in many work situations multitasking is forced: incited by entities and their agency attention is attracted away from initial activities. This is considered annoying or disrupting, for respondents feel interrupted or hindered in performing the initial activity, or interfered in their pleasant feeling of 'flow' of full concentration on one activity. It also incites feelings of fragmented activity performance and inefficiency, because considerable time is needed to retrieve full concentration, especially in case of creative activities, such as writing, or activities with complex contents. Annoyance also occurs when the 'intervening' activity is

irrelevant in that particular situation. Furthermore, the nature of the two activities in respect to each other is of importance: switching attention between two activities that differ widely in terms of contents requires much effort. Concerning this, Susan argues:

"I am annoyed, because I would have really liked to continue working on the paper I was working on. […] Sometimes you are busy and then someone brings up a question which lies far away from what I was doing and for which I need to look into documents myself. Well, then I need to go all the way back to find out what I was working on. And that is not efficient and I like to work efficient, so that is what irritates me about that" – Susan (43)

Nevertheless, respondents also report positive feelings involved with such multitasking practices because it gives them a feeling of connectedness and company, breaking through isolation. Ellen reports experiencing satisfaction and control:

"I was working well [on a document], while in the meantime I was having a conversation with a colleague who was working on another project. So that came running through. […] It gives a kind of pressure, kind of something has to be finished and you're working towards that satisfaction of it being finished. And different things are to be dealt with simultaneously and I can deal with them, so it gives a feeling of control. That works really well. " – Ellen (31)

The technologies and the actors behind these technologies have considerable signalling and descriptive powers (González & Mark, 2004). Thereby they can influence people's decision to engage in multitasking and alter the spatio-temporal situation. As Ray indicates, when multitasking writing a scientific article and reading an e-mail (type A):

"[Y]ou plunge into something while you actually don't want to, but in the end you become absorbed in it […]. Depending on the sender, I may think it's necessary to directly read it. You don't always know what it'll be about of course. And you open it and you don't expect it to be a big deal, but then it turns out to be quite serious. When I look back then, it sometimes has cost me 45 minutes." – Ray (41)

Ray's story shows the considerable power e-mails have in altering the situation: because of the instantaneous access to new information, purposefully communicated to the receiver they are a *"temptation"*, respondents argue: information comes in a stand-by position in the mailbox, waiting to be read, one mouse click away. Similar powers are at play in multitasking other communication activities and often people's decision to engage in multitasking stems from curiosity towards the contents of new information which can be accessed. The power of social relations with colleagues, are of importance here. For instance, feelings of social pressure and expectations of others that are waiting for a rapid response, or norms from work or personal norms can embed multitasking (Baron, 2005). Power relations involved between the sender and receiver, and their (shared) interrelatedness with other actors underlies the importance of the message. For instance, an internal phone call from a close colleague at work is considered less important than a phone call from an important client. These powers at play may explain why respondents often engage in multitasking at work, despite negative experiences involved.

It also happens that situations occur in which multitasking is actively engaged in by respondents. Everyday life is intertwined with schedules made up of sets of fixed times and locations: for instance, weekly work meetings take place Wednesday between 9:00-11:00 a.m. and at 4:00 p.m. kids have to be picked up from school. Appealing to the temporal and spatial flexibility of particular activities then is used to account for the temporal and spatial fixity of others. These multitasking performances mainly involve a swift alternation of low attention activities, with higher density of curves (type B multitasking). Adam argues, before leaving to give a jogging training:

"In such a situation I can multitask whatever I want. I am sitting at the table over here and my daughter sits [in front of me] over there doing her homework and I think I was testing her on English vocabulary, so I mention the words. Meanwhile, I am making a list of participants for the jogging training I give and I also had to make a phone call for my work, which I then called in between whiles. That's how it goes and it all goes alongside one another and concurrently." – Adam (45)

The different networks of relations at play in the spatio-temporal situation underlie the occurrence of multitasking practices: the coinciding presence of Adam and his daughter, and of particular materials, the table and Adam's laptop. Adam's decision to engage in multitasking in this situation stems from his wish to help his daughter before he is off to responsibilities fixed in time and location.

Similar performances of multitasking occur in domestic situations. The presence of household members, newspaper, food, dirty dishes hold multitasking opportunities and often are multitasked to deal with time pressure from fixed appointments and responsibilities. In this performance of combining different short duration low attention activities (type B multitasking), respondents show awareness of attention particular activities need. As Amy argues about multitasking cooking with other 'responsibilities':

"Yeah, that all goes comfortably simultaneously. Yes, and during the week I don't cook very complicated meals, so then I can easily read the newspaper and I printed something for a job for a publisher. […] and then I make a phone call, because cooking and making phone calls I can also do simultaneously very well" - Amy (45)

The experiences involved with type B multitasking are generally speaking more positive than those involved with type A. This could be due to the voluntary engagement which often was reported in this type of multitasking. However, respondents also reported that when being tuned into fast and repeatedly altering the focus of attention, it is easy to engage into other activities which present themselves, because these do not require radically altering the tempo of their performance. This comes with feelings of satisfaction of efficiency. Nevertheless, making a switch between high intensity rhythms of activity behaviour and low intensity rhythms, in which the performance of activities performed is less rapid, can be problematic:

"The rhythm is so high then, that reading a book in the evening for an hour is too much of a contrast. […] I cannot change gear anymore [to a lower tempo]" - Amy (45)

Another situation in which low attention activities are combined is in the combination of a listening activity with another activity. Attention in these occurrences is shifted between auditory impulses and other activities. This happens, for instance, at work whilst listening to a reading or during a meeting. Multiple respondents reported combining watching television and reading a newspaper or magazine:

"I listen with half an ear then [to a sports program on television], and when it does not involve the Premier League I don't find it that interesting. But when it involves major soccer clubs from the Premier League, than I think 'oh, listen for a bit'. […]And, well, it's just, sometimes you're really into an article so you read that, and then you miss ten minutes of soccer or vice versa. It's just how it comes and goes; if you hear them speaking about Bayern München, you think, ah yes [now I will listen again]" - Noah (43)

This performance of multitasking practices shows how the process of dividing and re-dividing attention works. Additionally, it shows how sensorial information is implicated in the process of multitasking and the considerable agency those sensorial impulses have in terms of demanding attention in a situation.

Negotiations

Sensorial information can also be actively created or altered by individuals by negotiating the spatio-temporal situation, so that multitasking is supported or avoided. Negotiations of multitasking often involve a work activity. Looking at the experiences involved, it is not surprising that forced multitasking which mostly is found to occur in type A multitasking, is often tried to be avoided. When encountering a situation in which multitasking is bound to occur, individuals make considerations about engagement in multitasking practices in respect of the current situation. Impulses are, for instance, ignored or postponed, when there is a satisfactory level of concentration in engagement in the current activity, especially when this concerns high attention activities. The sensed impulse is negotiated to such an extent that it is tempered and the individual can resume the initial activity:

"Look, when I'm working on something really focussed, then I have to finish it. When you're just typing a sentence and you get a phone call, yeah, then I have to finish my sentence, otherwise I lose it. So, when the phone then rings, fine, and if they hang up, fine too. I mean, then I will call them back a minute later. I do always try to finish what I'm working on; otherwise I might lose my brilliant sentence" – Noah (43)

Especially when it comes to communication technologies impulses can in different manners (Baron, 2005). Indeed, some respondents shut down their e-mail programme and lift the receiver of their phone or redirect calls to a secretary or reception desk to limit incoming messages. Additionally, the presence of actors is negotiated, for instance by removing them from a particular space.

Another strategy used is altering position in the space in relation to actors present. In this way, the agency of other actors present can be arranged as to be less confronting and appealing to the individual:

"I prefer to read here [at a small conference table in the room, at a chair directed away from the sight of the computer]. When I have to read for 5 minutes or longer and it's work from a student or an article or something, that's unpleasant to read at my normal desk. The desk is very much focussed on working with a personal computer and over here I can sit more relaxed. Also, here I choose: I am going to read, whereas over there anything can happen' – Ray (41)

The strategy of selecting particular spatio-temporal situations is also employed by respondents. Respondents indicate moving to a silent room, such as a conference room or, in domestic situations, the kitchen, with no other human actors, computers or telephone. When it concerns working activities, respondents report making one invisible for colleagues by working at home instead of at the office. This strategy is used when time-pressure is at play and people wish to focus on one activity for a long time in order to finish it. They thus mediate the presence of other actors as well as their own presence by making themselves untraceable.

"When I need to finish a document or write an article I will work at home. Yeah, then I don't want to be at work. [At home] no one sees me, so no one can come and ask me things, so they could walk to my desk and see I'm not there. And before colleagues will then get their phone and call me at home or e-mail me, that is a bigger threshold than just buttonhole someone. […] I also move to different kinds of meeting rooms. Sometimes when I have to finish something, I might decide to take my laptop and all my stuff and get into a space where no one can bother me. Then I will also leave my mobile phone lying at my desk, so they can't find me by calling either" – Susan (43)

Susan plans for ensuring not to get engaged in multitasking practices. Planning, indeed, happens on different occasions in organising the performance of activities in particular temporalities. In contrast, multitasking is also planned, for instance, when 'empty' or unimportant time slots are anticipated:

"[T]hose meetings, soon last one and half hours and things are discussed which are not important for me, so I will just do my own tasks. I usually bring a document to read in a meeting […] So, I listen and read, that's how it goes. I try to keep an eye on which topic is discussed and meanwhile I read the document at a glance." – Adam (45)

Spatio-temporal situations may also be selected as to ensure a set of sensorial impulses which allow the individual to focus on particular activities:

"[At home] I get less interrupted and disturbed with issues. Being able to put on music, make myself a cup of coffee, treacle waffle [Dutch cookie] to it. And then I like to work hard on just one task. […] that is something from my secondary school period, then I often listed to very loud music, creating a kind of cocoon of own sounds at which concentrating works extremely good. And that cup of coffee distracts me, but it's my own choice." - Adam (45)

Thus, the combination of monotonous auditory impulses with other activities can function as a sensory 'cocoon', in which the setting for paying attention to particular activities is optimized. Dealing with multiple entities which require attention is thus not necessary problematic and indeed studies have shown that the presence of music

played at the background is associated with a pleasant working atmosphere to perform particular activities (Lesiuk, 2005). Likewise, respondents report the monotonous buzzing of voices on the workplace entail a comforting atmosphere to perform tasks because it associates with other colleagues being present.

Finally, some respondents hardly ever engage in multitasking. Reasons why they do this differ: some argue they are simply incapable of multitasking, especially men. For others, multitasking is not a comfortable way to make use of their time, because it incites feelings of stress and hurriedness. They therefore argue to avoid enrolment in multitasking by ensuring there is enough time available to perform all tasks sequentially. By waking up an hour earlier in the morning, for example, there is more temporal margin to deal with children obstructing the morning routine. It is also reported by some respondents to hold to a very strict schedule in which tasks are neatly spread over time available. This is aimed for by respondents; however, this remains a hard task.

This section reveals the complexities entangled in multitasking practices stemming from the environmental context and activities involved. Instead of purposefully performed, multitasking is often implicated in the presence of different actors and their agency. The different performances of multitasking have shown to come with manifold experiences. In response to these experiences and people's awareness of agency of particular entities people have developed different strategies to support, alter or avoid multitasking practices.

5 Conclusion and discussion

The aim of this study was to provide insight in the occurrence of multitasking and people's experiences and negotiations of multitasking practices. By understanding the role of attention in inciting activities, this study argues multitasking has to be understood as a relational process embedded by the interplay of different events, objects, humans and other actors present in the environmental setting. Following a relational framework space-time, multitasking defines its own spatio-temporal framework and the different times and locales involved come together in an individual's perception of the intensive performance of multiple activities in a limited time span. Therefore, multitasking is defined as the perceived simultaneous performance of multiple activities in a certain time span. From the theoretical framework two particular types of multitasking are considered: one involves the combination of long duration high attention activities with shorter activities of differing attention, the other takes the shape of a swift rhythm of switching attention between activities of differing attention within a limited time span.

The findings of this study show the versatility of multitasking in terms of performance involving different spatio-temporalities and activity combinations. Both types of multitasking presented in the theoretical framework were identified in the analysis of the results. As indicated by the wide range of situations in which multitasking is studied (e.g. Baron, 2005; Gonzales and Mark, 2004; Ohomori and Harata, 2008) multitasking occurs in different situations. In this research multitasking was especially prevalent in domestic situations and work situations, involving different social and material entities present. In many cases, the power these entities have or represent, 'forced' respondents into multitasking practices. Multitasking is also performed as a

means to be efficient and to overcome temporal fixities of schedules and appointments. In this way, individuals reconfigure their spatio-temporal pattern in order to deal with multiple activities (Kenyon and Lyons, 2007). Furthermore, implicated in the nature of activities concerned, results show engagement in multitasking reconfigures the temporal and situational setting, outside of the individual's intentions.

These reconfigurations of spatio-temporalities embed experiences of space and especially time of individuals involved in multitasking. The disruption of planned time slots is often considered negative, for it costs time, whilst positive experiences involve feelings of efficient use of time. The wide variety of negative and positive implications discussed in the literature is resembled in the findings of this study (e.g. Floro and Miles, 2003). Additionally, results from this study demonstrate the importance of situational complexities at play in embedding experiences of multitasking. In response to these experiences that respondents in this study employ strategies in order to negotiate multitasking practices by mediating the presence and power of actors in spatio-temporal settings, for instance by muting technologies or by choosing a particular position in the spatio-temporal material situation. Furthermore, spatio-temporalities are selected to perform activities as to avoid or support multitasking, by choosing spaces without many entities present or employing strict planning of activities. It also happens that hardly any multitasking is performed, especially amongst men. An explanation for this may be that, especially in western societies, in contrast to men, women have been acculturated into multitasking as a result of fulfilling both working and domestic roles (Floro & Miles, 2003).

The relational approach used in this study has proven to unravel the true richness of the phenomenon of multitasking. It has demonstrated the importance of accounting for different entities and events present in the environmental context in inciting activity behaviour of individuals. Future research on multitasking should preferably take into account the complexities involved, depending on the particular multitasking phenomenon investigated, such as multitasking in computer work, or multitasking different responsibilities of care and employment. Likewise, future research on activity behaviour, such as travel behaviour or social interaction, should account for the environmental complexities at play, as well as for the performance of multitasking in these situations. A relational approach of multitasking furthermore has proven useful in understanding how people's lived experiences come about: it is not so much the usage of absolute time, but rather the experience of relational space-time that underlies people's daily activity behaviour. Consequently, a relational approach should be further explored in investigating concepts such as stress, hurriedness and intensification of social life for this can provide better insight in how these perceived experiences come about. Another aspect for future studies on multitasking is to address populations groups such as youngsters, or those without children. Amongst such groups, multitasking may involve other activities, experiences and negotiations than amongst men and women from dual-income households with children. In order to come to a full understanding of the role of multitasking in contemporary societies, other groups should also be investigated.

The findings of this study have to be considered in respect of methodological and pragmatic choices made; these follow limitations. Although a qualitative approach is useful for empirically supporting theoretical insights, it is limited in the extent to

which results can be generalized for the research population. Also, inaccuracy in data resulting from respondents themselves filling in the activity-diaries may have occurred; in using self-keeping diaries this however inevitable. This drawback may be partly overcome by the interviews conducted.

Because of the many associations with daily life aspects, the findings of this study may indicate valuable issues for policy-makers and others from the field. The lay-out of environmental contexts in inciting people's activity behaviour is something that can be taken into account in designing (semi-)public and private spaces, such as office buildings, transportation spaces or educational spaces, such as schools and libraries. As such, the results of this study can be of use for urban planners, transport planners, architects and interior designers. In addition, the role of lived time and place in underlying people's experiences can provide useful information for those involved with people's well-being, such as psychologists or personal coaches on how people's well-being can be altered and optimized. These aspects are further emphasized by the fact that contemporary space-times are becoming increasingly intensified and daily life more and more takes place in such intensified space-times because of increasing urbanization (Wajcman, 2008). It is precisely because today we live attention demanding lives in attention demanding environments, that we should also consider the importance of accounting for less intensive moments in life and less intensive spaces.

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