Human Performance, 28:112–136, 2015

ISSN: 0895-9285 print/1532-7043 online
DOI: 10.1080/08959285.2014.976706

Routledge
Taylor & Francis Group

Polychronicity and Multitasking: A Diary Study at Work

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Polychronicity and multitasking have been described as being indispensible in work today because they enable people to use their time flexibly and effectively. We conducted a diary study among 93 employees during the mornings and evenings of 5 consecutive workdays ($n = 418$ observations). The study used hierarchical linear modeling with polychronicity and other personal characteristics at the person level, and multitasking behavior along with multitasking opportunities, interruptions, and unplanned work as antecedents, and affective well-being and self-rated performance as outcomes at the day level. We found several relations between antecedents and multitasking, as well as between multitasking and consequences. Polychronicity interacts with these relationships, such that polychronic individuals' affective well-being and self-rated performance are less affected on days with much multitasking compared to monochronic individuals.

The continuingly changing demands in today's interconnected workplaces, the concentration of multiple duties in the same jobs, and the growing emphasis on speed and flexibility have made multitasking a necessity in the work of many (Appelbaum, Marchionni, & Fernandez, 2008). Current job descriptions often ask for multitasking ability. For example, typing in a job search on Monster.com with the keyword "multitasking" as requirement reveals thousands of hits. Despite the trend of recruiting multitaskers, there has been surprisingly limited research on multitasking in everyday work settings. Previously, multitasking has been conceived as a cognitive ability or as a cognitive process and has mainly been studied in laboratory environments within very short time windows (seconds, minutes). Studies aiming to understand multitasking in everyday work-life are rather scarce, but they are highly needed because of the growing prevalence and significance of multitasking in organizations. Adding to the outcomes of research on multitasking in lab settings, this study contributes to the understanding of multitasking by including the context of a work setting and by examining changes in multitasking and its effects over the course of several days. As far as we are aware, this study is the first study to investigate multitasking in the workplace, looking at variations in multitasking across working days. Our aim is twofold: first, a better understanding of multitasking, its personal and workplace antecedents, and its consequences for performance and affective well-being; second, clarifying the role of polychronicity,

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people's preference for multitasking. We hope both to advance our theoretical understanding of multitasking and to extend this knowledge to practice.

Although polychronicity and multitasking are often seen as related, they are quite different phenomena (König & Waller, 2010). Polychronicity is a stable individual difference variable that describes how people differ in their general preference for multitasking. Multitasking is a dynamic phenomenon, something that "happens" (Roe, 2008) as people perform two or more tasks simultaneously. Because differential (between-subjects) analyses are unable to provide information about dynamic phenomena, and temporal analyses (within-subjects) do not provide information about differences between people (Molenaar, Huizenga, & Nesselroade, 2003; Roe, 2013), we adopt a multilevel approach that allows studying "interindividual differences in intraindividual variation." This enables us to examine the dynamics of multitasking, along with antecedents and consequences, as it varies over subsequent workdays, and to determine whether there are differences in this variation between people with different degrees of polychronicity. That is, we examine whether polychronicity has a moderating effect on the relation between multitasking and outcomes on a daily basis. Thus, our study contributes to the literature in three ways: (a) We investigate multitasking in a workplace setting, (b) we focus on variations of multitasking across working days, and (c) we study polychronicity as a moderator of the relation between multitasking and its consequences.

Perspectives on Multitasking

Multitasking can be defined as simultaneously carrying out two or more tasks within a certain period. The term originates from computer science (e.g., Kelman, Shah, & Smaalders, 1996), where it refers to handling parallel processes that require the same resources. Simultaneity does not mean that all resources are fully used and shared from the beginning until the end of the period. It is possible to work intermittently on overlapping tasks during the same period, switching from one to the other. Thus, task switching is inherent in multitasking, in computers as well as in people. Multitasking has been studied from different perspectives and in different contexts with differences in the scope of tasks and the period considered. A present-day example is driving a car while navigating in an unknown city (Wu, Zhao, Lin, & Lee, 2013). Several studies have been conducted by selection psychologists, with the aim to identify job applicants who have the ability to carry out multiple tasks simultaneously (cf. Sanderson, Bruk-Lee, Viswesvaran, Gutierrez, & Kantrowitz, 2013; van der Horst, Klehe, & Van Leeuwen, 2012). Cognitive and neuro-psychologists have studied multitasking from another angle, namely, with a focus on mechanisms and processes involved in parallel cognitive activities, such as recognizing a visual or auditory pattern, retrieving memory content, choosing a motor response, or carrying out a tracking operation (e.g., Salvucci & Taatgen, 2008). In both types of research, the interest is in narrowly defined cognitive tasks presented in a controlled (assessment or laboratory) environment and studied within limited time windows (rarely more than an hour) with units of milliseconds or seconds. Such research goes into great detail, measuring response times (in milliseconds), error rates (Monsell, 2003), or brain functioning (Burgess, Veitch, De Lacy Costello, & Shallice, 2000; Just, Carpenter, & Miyake, 2003).

Following König and Waller (2010), we study multitasking at the workplace, looking at the execution of work tasks within a broader time window. We define work tasks as goals to be

accomplished in the context of a person's role in an organization. As for the time window, we look at workdays in a workweek. It is important to note that the change of time window affects the meaning of simultaneity and multitasking, and can lead to different results (Roe, in press; Zaheer, Albert, & Zaheer, 1999). All tasks a person works on during certain parts of the day will be considered to be happening simultaneously, and thus be captured by the term *multitasking*, regardless of the number of parts of the task being executed and their length. According to Pashler (2000), the frequent switching between multiple and different tasks is a substantial component of multitasking in work settings. In this study, we look at multitasking as varying from working on a single task per day (lower scale end) to working on many tasks throughout the day with frequent switching behavior between those tasks (higher scale end).

Multitasking is often thought of as a differential variable, implying that when people are given the same tasks, some would finish one task before starting to work on a new task (low multitasking), whereas others would perform them in parallel (high multitasking). There is indirect evidence for such differences from a study that used a scale to inquire about typical behaviors within one a hour (König, Oberacher, & Kleinmann, 2010). A possible ground for such differences could be people's general preference for a certain degree of multitasking, that is, polychronicity. Little is known about the variability of multitasking over time. There are, to our knowledge, no studies that have conceived multitasking as a variable behavior over time and that studied it in a dynamic perspective. Considering the temporal footprint of work (Roe, in press), that is, the way in which work activities unfold during the hours of the day, the days of the week, and so on, it is likely that multitasking fluctuates during the day and across days, just like is the case for performance (cf. Binnewies, Sonnentag, & Mojza, 2009). This is the reason for us to study intraindividual differences in multitasking, as recommended by König et al. (2010).

Polychronicity

There is a considerable body of literature suggesting individual differences in the preference for multitasking, called polychronicity versus monochronicity (e.g., Slocombe & Bluedorn, 1999). Poposki and Oswald (2010) defined polychronicity as "an individual's preference for shifting attention among ongoing tasks, rather than focusing on one task until completion and then switching to another task" (p. 9). Differential research has shown the importance of polychronicity in predicting job performance (Kantrowitz, Grelle, Beaty, & Wolf, 2012). The moderating role of polychronicity in the (differential) relation between multitasking ability and performance at work has also been demonstrated (Sanderson et al., 2013). Thus, previous studies assessed trait-level multitasking and polychronicity and have not looked into variations in these variables over time.

Some researchers have treated the concepts polychronicity and multitasking as synonyms, assuming that a given level of polychronicity implies a certain degree of multitasking (Bluedorn, 2002; Spink, Cole, & Waller, 2008). Like König and Waller (2010) and Poposki and Oswald (2010), we challenge this assumption, because of the conceptual differences between the two notions. Polychronicity is a traitlike preference, whereas multitasking is a behavior that can vary with task demands, changing work conditions, and the persons psycho-physiological state. We think that the relationship between polychronicity as a stable preference and multitasking as a dynamic phenomenon needs to be explored empirically.

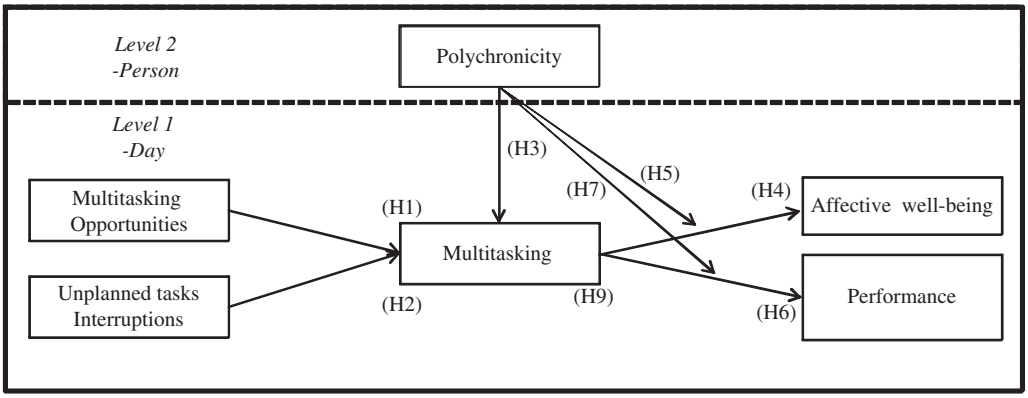

FIGURE 1 Conceptual model.

Conceptual Model

Because we assume that multitasking changes over time, whereas polychronicity is supposed to be a stable individual characteristic, the conceptual model for our study, as presented in **Figure 1**, is composed of two levels. Level 1, the level of the day, comprises states and processes that are supposed to occur within each person across days. Level 2 is characterized by between-person differences in polychronicity and a number of control variables, namely, gender, age, job autonomy, control of time, conscientiousness, and extraversion. We hypothesize that the degree of within-person change across days in multitasking depends on certain factors that can vary from day to day, that is, multitasking opportunities and interruptions and unplanned tasks. In addition, we hypothesize that variations in multitasking will be related to variations in affective well-being and performance. As the model shows, we will also combine the person and day-level factors, postulating certain cross-level interactions, namely, a moderating effect of polychronicity on the relationship between day-level multitasking and performance, as well as affective well-being, at the end of a working day.

Antecedents of Multitasking

An increasing number of scholars have called for research addressing the dynamic nature of work-related phenomena by including time in theory and research designs (e.g., George & Jones, 2000; Mitchell & James, 2001; Roe, 2008). It is likely that variable circumstances will make people work in a particular way even though they may have a general preference to work on multiple goals in parallel or in a sequential manner (Kirchberg, Roe, & Van Eerde, 2009). For example, an employee who is highly monochronic may find herself in a job, for example, a secretarial job, where it is expected to engage in multiple tasks at the same time. While writing a document, the phone may ring and an e-mail may pop up that requires an immediate answer. Although the employee may prefer to finish the writing task first, she may feel a pressure to switch to picking up the phone and answering the e-mail before returning to the original task.

Thus, besides personal preferences for monochronic or polychronic working styles, external work conditions may influence the level of multitasking employees actually engage in.

Before elaborating on the role of these variable working conditions, we would like to state that polychronicity can still be seen as an antecedent of multitasking, in a differential sense. This is in line with findings by König et al. (2010), who in a cross-sectional study demonstrated that polychronicity is positively related to self-rated multitasking.

H1: Polychronicity is positively related to the average daily level of multitasking.

Thus, we do not assume that multitasking preference exclusively and always translates into the corresponding behavior, as there are variations in external and internal demands across days. We put forward that multitasking varies across days and that polychronicity is a person-level predictor of multitasking in general. Jobs such as receptionist or air traffic controller require the simultaneous execution of many tasks. However, multitasking behavior may vary due to variations in the opportunities for multitasking (e.g., actual variations in tasks) across working days. Also, many employees have a certain degree of job autonomy that allows them to decide how to work on their multiple goals—serially or in parallel.

Unlike previous research, which has assumed or at least implied that multitasking is a stable phenomenon, we assume that multitasking varies over time. Not every working day is the same; as some working days are more hectic than others, they may expose the employee to conditions that vary in the room for multitasking. Such daily variations may lead to different degrees of multitasking behavior. Hecht and Allen (2005) studied the consequences of fit between individual polychronicity and "polychronicity supplies" stemming from the job. Polychronicity supplies are defined as the opportunities to work on multiple tasks at once (Hecht & Allen, 2005). We propose to simply use the term "opportunities to multitask" to indicate the opportunities an employee is facing each working day. On days with many opportunities, people may engage in multitasking because they have to or because they consider it useful (Kaufman-Scarborough & Lindquist, 1999). Thus, we propose that daily multitasking will depend on daily changing multitasking opportunities stemming from the job—other things being equal, thus controlling for job autonomy and employees' perceived control of time.

H2: Opportunities to multitask on a given day are positively related to multitasking on that day.

Further sources of multitasking can be interruptions and unplanned tasks encountered throughout the working day. Interruptions are defined as "incidents or occurrences that impede or delay organizational members as they attempt to make progress on work tasks" and are categorized into intrusions, breaks, distractions, and discrepancies (Jett & George, 2003, p. 494). Interruptions can be internal (self-initiated; e.g., a break) and external, which means that their occurrence is beyond the control of the employee (e.g., an intrusion). We propose that interruptions are likely to lead to more multitasking, as any onset of an activity that demands immediate attention causes a shift of attention from the focal task to a new one and requires switching back at a later time (Eyrolle & Cellier, 2000; Zijlstra, Roe, Leonora, & Krediet, 1999). The more interruptions occur on a day, the more the employee may engage in multitasking, in response to the external needs or internal demands.

Employees are also frequently confronted with unplanned tasks during the workday—which represent additional work to be done. In a diary study by Claessens, Van Eerde, Rutte, and Roe

(2010), the average percentage of unplanned tasks employees worked on per day was about 15% with substantial variation. Employees are generally expected to carry out and complete these unplanned tasks. Following the same argument as just presented for interruptions, we expect that unplanned tasks also are likely to produce multitasking.

H3a: Interruptions on a given day are positively related to multitasking on that day.
H3b: Unplanned tasks on a given day are positively related to multitasking on that day.

Consequences of Multitasking and Affective Well-Being after Work

Although the consequences of multitasking at work attract increasing attention, to our knowledge, no study investigated the relationship from a dynamic perspective. Yet it is important to consider that multitasking can have negative effects. Experiments and differential studies suggest that multitasking can lead to a higher level of stress (Robinson & Smallman, 2006), mood and anxiety problems (Becker, Alzahabi, & Hopwood, 2013), and irritation at the end of the working day (Baethge & Rigotti, 2013). There are several reasons to expect such effects. The increased cognitive demands required by executing multiple tasks, and by task switching and resumption, can lead to depletion of cognitive resources and produce negative emotions (Zijlstra et al., 1999). Besides these cognitive costs, people will realize that the time available for the remaining work is reduced, which in turn requires them to increase their work pace to finish essential tasks (Jett & George, 2003). Moreover, the lack of predictability of task progress and of the tasks themselves may reduce people's perceived control of time, which can lead to stress and anxiety (Claessens, 2004; Macan, 1996). Considering these effects, which fit well into a conservation of resources framework (Hobfoll, 1989), we posit that multitasking is generally negatively related to perceived positive affective well-being after work.

H4: Daily multitasking is negatively related to daily affective well-being.

The effects of multitasking may not be the same for all people. Individuals who perceive their tasks as repetitive or who easily get bored may find satisfaction in changing work activity and managing the complexity associated with multitasking opportunities. Other employees rather wish to avoid such changes in their workplace or be unable to handle the juggling of multiple simultaneous tasks, experiencing decreased levels of affective well-being at the end of the working day. Hecht and Allen (2005) examined job–person fit in polychronicity and its relationship with well-being. They showed that there is a positive effect on well-being if an employee scores high on polychronicity and the job calls for multitasking. We expect the same for day-level multitasking. If polychronicity is high and the extent of day-level multitasking is also high, well-being is likely to be greater because there is a match between the allocation of resources that is preferred and actually needed. However, if an employee scores low on polychronicity, thus generally prefers not to engage in multitasking but nevertheless needs to engage in multitasking, there will be a negative effect on affective well-being.

H5: Polychronicity moderates the relationship between day-level multitasking and affective well-being, such that low polychronicity enhances the negative relation between multitasking and well-being. High polychronicity weakens this negative effect.

Day-Level Multitasking and Performance

Performance of employees varies across days for many reasons (e.g., Beal, Weiss, Barros, & MacDermid, 2005; Roe, 1999, in press). We propose that multitasking, as a facet of the way in which daily tasks unfold, is one of them. There are an increasing number of studies suggesting that multitasking is related to performance. Although some studies point at positive effects of multitasking on performance, the preponderance of studies show negative relations between multitasking and performance. Positive effects are mainly due to progression on two or more tasks at the same time. However, these are constrained by cognitive resources required for executing the tasks (Wickens & McCarley, 2008). It may be possible to read an e-mail while talking on the phone, but it is not possible to get a presentation ready while preparing a travel expense report. As soon as task switching is required, the time gain advantage disappears. Research on multitasking ability also seems to suggest that multitasking is positively related to performance, but the ability cannot be equated to actual multitasking behavior. It is rather an indication of fluid intelligence or other cognitive ability (Morgan et al., 2013; van der Horst et al., 2012).

In most cases, negative effects of multitasking on performance have been found. Experimental studies found negative relationships with performance (Adler & Benbunan-Fich, 2012, 2013; Buser & Peter, 2012; Hodgetts & Jones, 2006; Pashler, 2000), mainly attributed to performance decrements as a consequence of switching costs. Delbridge (2001) found that working on a single task or goal results in fewer errors and less time compared to working on multiple tasks or goals. There is also evidence showing that negative performance impacts of interruptions, which are often implied in multitasking. For instance, Eyrolle and Cellier (2000) found that interruptions in work tasks increase the processing time of the focal task and increase the mean error rate. Similar results were obtained by Zijlstra et al. (1999). Research has shown that performance decrements can be explained not only by the cognitive costs of resuming the main task but also by prospective memory failure (Baethge & Rigotti, 2013; Czerwinski, Horvitz, & Wilhite, 2004; Dismukes, 2012; McDaniel & Einstein, 2000): The person forgets what the next step to be executed is. This is particularly relevant in areas such as medicine and aviation. Crenshaw (2008), referring to aviation, dismissed multitasking as an effective way of working, arguing that it is generally damaging to work productivity. Depletion of resources during task switching, resulting in fatigue, offers an additional explanation for performance decline. This is likely to be the most salient part of performance on a daily basis. Thus, for daily time intervals, we put forward that multitasking generally lowers performance.

H6: Daily multitasking is negatively related to daily performance.

Similar to our reasoning for H5, we expect that the negative effect of multitasking will be less in persons with high degrees of polychronicity. We derive our argument from the person–job fit literature (Kristof, 1996). Previous studies have shown that the fit between conditions favoring multitasking, that is, demands or opportunities, and polychronicity is associated with job performance (Hecht & Allen, 2005; Jansen & Kristof-Brown, 2005). In other words, if the conditions are favorable for multitasking and people prefer working on multiple tasks simultaneously, they will report higher performance. Yet monochronic employees may choose not to multitask when confronted with such conditions. The moderating effect of polychronicity on the relation between multitasking ability and performance was also shown in a previous (differential) study (Sanderson et al., 2013). Thus, we state the following hypothesis:

H7: Polychronicity moderates the relationship between day-level multitasking and affective performance, such that low polychronicity enhances the negative relation between multitasking and performance. High polychronicity weakens this negative effect.

METHOD

First, participants received a paper-based questionnaire. In this questionnaire we assessed participants' preferences, characteristics, and demographics. Next to the paper-based questionnaire we distributed handheld computers (Palmtop Z22) and asked participants to fill in daily questionnaires on these devices during their next working week. Attached to the questionnaire was a general invitation letter. The letter asked participants to fill in the paper-based questionnaire before starting the 1-week diary phase. We instructed the participants on how to use the handheld computers, either individually or in a group meeting. On Monday, people started the diary phase, which lasted for 1 work week (5 days of data collection). During the week, participants answered one questionnaire in the morning before starting to work and one after the workday was over. These daily questionnaires appeared on the screen of the handheld computers after a self-initiated start. Every participant obtained a message on how to start the questionnaire to make sure that everyone was able to conduct the self-initiated start.

Participants were asked to note the identification number visible on their handheld computers on the general questionnaire for later matching. After the diary phase, participants put the paper questionnaire in an envelope and returned it to the researcher together with the handheld computers. The data were analyzed using hierarchical linear modeling.

Sample

The respondents were recruited through personal contacts to firms (12 in total), all located in Western Germany. The contact person of the respective firm provided us the opportunity to distribute questionnaires and handheld devices to other employees in the organization. Generally we met participants personally (individual or group meetings) and provided them with the paper-based questionnaire. Among those who agreed to participate in the study we distributed Palmtops. In total, we received 111 completed paper questionnaires. Missing data, incorrect diary entries (e.g., both questionnaires answered in the morning), and technical failure of the handheld devices (resulting of complete diary data loss in some cases) led to a reduced sample. The final sample consisted of 93 participants who had filled in the paper questionnaire and the daily diary. All questions were translated from English into German and back-translated, checked by bilingual speakers afterward, and checked for understandability with five persons who were not involved in the study.

Participation was voluntary, and no monetary or other reward was provided for study compliance. The participating employees were mostly (44%) working for medium-sized companies (100–499 employees) and had a full-time contract (83%). Participants' work descriptions were quite diverse, with most people working in the following areas: accountancy and control (17%), administration (14%), and sales (12%). Overall, 41 women participated, and all age categories were represented (25% younger than 30 and 15% older than 51 years). About 36 % had a managing position, and most people (39%) had been employed in the company for 6 to 15 years.

Questionnaire Measures at Person Level

The measures included in the questionnaire assess preferences, personality traits, and demographic characteristics. Most of the questions of the questionnaire and the diary had to be answered on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Some questions used a frequency scale with anchors ranging from 1 (*almost never*) to 5 (*almost always*). After participants agreed to participate in the study, they received the paper questionnaire and were asked to answer the questions before the start of the diary phase.

Polychronicity. This variable was measured with 14 items of a scale developed by Poposki and Oswald (2010). In contrast to previous scales of polychronicity, these authors emphasized that the preference for multitasking should be evaluated, not actual behavior. Moreover, they used the day-level as a time anchor reflecting our definition of multitasking. A sample item is "I prefer to work on several projects in a day, rather than completing one project and then switching to another." The Cronbach's alpha was .84.

Conscientiousness and Extraversion. These variables were measured with six items each from the scale developed by Hendriks, Hofstee, and De Raad (1999). Because previous research had shown relations between personality characteristics such as Conscientiousness and Extraversion and polychronicity and related performance (Conte & Gintoft, 2005; Poposki & Oswald, 2010), we included these constructs as control variables. Exemplary items are "I like to follow a regular schedule" for Conscientiousness and "I keep apart from others" (reverse coded) for Extraversion. Both scales showed low reliabilities with Cronbach's alpha of .58 and .56, respectively. Deleting the items "I slap people on the back" and "I laugh aloud," which are socially less desirable in Germany, were deleted from the Extraversion scale, leading to an improved Cronbach's alpha of .74. The reliability result also reflects the low factor loadings these two items originally had when the scale was developed (Hendriks et al., 1999). Deleting items from the Conscientiousness scale did not raise Cronbach's alpha, and the scale was not changed.

Control of time. This variable was measured with an adapted and extended version of a scale originally used by Macan (1994) and later further developed by Claessens, Van Eerde, Rutte, and Roe (2004). The five items are "I feel in control of my time," "I find it difficult to keep to my schedule" (reverse coded), "I feel that I have my work under control," "I feel confident in that I am able to complete my work on time," and "I often have little control of what is happening at work." Cronbach's alpha was .70. Because individuals with more control of time are more likely to follow their preference and those with less control of time could not, we used control of time as a control variable.

Job autonomy. This variable was measured with nine items taken from the Job Autonomy scale developed by Morgeson and Humphrey (2006). Originally, the scale was composed of three different factors, namely, work scheduling autonomy, decision-making autonomy, and work methods autonomy. Exemplary items are "The job allows me to make my own decisions about how to schedule my work" and "The job allows me to make a lot of decisions on my own." The scale was highly reliable (Cronbach's $\alpha = .93$). Similar to control of time, we controlled for job

autonomy to rule out the effect of being able to organize the workday and because we conducted the study within different firms and across diverse hierarchical levels and jobs.

Demographics. These variables included age and gender, measured in categories and on a dichotomous scale, respectively. We control for the demographic factors age and gender, because these may be related to performance. For instance, an experiment showed that multitasking performance decreased with higher age as cognitive processing efficiency declines (Salthouse, Hambrick, Lukas, & Dell, 1996). Moreover, we can investigate popular assumptions about gender, multitasking, and performance claiming that women are more prone to multitask than men.

Diary Measures

On the day level, we collected data concerning the antecedents and multitasking as well as on performance and affect. In total, 93 participants participated, providing 480 observations over the days. However, as previously mentioned, there was some loss of data because participants filled only the morning or the evening questionnaire. As a result we had 418 observations with complete general, morning, and evening questionnaires.

Multitasking opportunities. This variable was measured with four items in the morning. The items were taken from a scale measuring polychronicity supplies defined as opportunities for polychronic time use at work (Hecht & Allen, 2005). We took four items of the original scale and rephrased them to reflect multitasking opportunities at the level of the day. An exemplary item is "Today, I have to spend a little bit of time on several tasks—moving back and forth from one thing to the other." Cronbach's alpha ranged between .70 and .78 across the 5 days.

Interruptions and unplanned tasks. Both variables were measured with a single item at the end of the workday to keep the questionnaire manageable. The extent of unplanned tasks was measured with the item "There were many unplanned tasks today" and the extent of interruptions with the item "Today, I was interrupted a lot."

Multitasking. This variable was assessed in the evening after work. We rephrased the four items from König et al.'s (2010) general multitasking scale to capture daily variations in multitasking. The items were "Today I worked on many tasks simultaneously," "Today I worked on more than one task," "Today I worked on tasks in a sequential manner" (reverse coded), and "Today I accomplished several tasks simultaneously." The Cronbach's alpha across the 5 days ranged between .89 and .92.

Affective well-being. We measured affective well-being with 10 adjectives representing five mood dimensions, namely, anxiety–comfort, depression–pleasure, bored–enthusiastic, tiredness–vigor, and angry–placid (Daniels, 2000). For each dimension, one negatively valenced and one positively valenced item was used. One example is "At the moment I feel tired" and "At the moment I feel active." Affective well-being was measured before and after the workday with the same scale. Cronbach's alpha for affective well-being in the morning ranged between .88 and .92 and for affective well-being in the evening between .83 and .93.

Performance. We measured this variable after work with four items drawn from the scale developed by Roe, Zinovieva, Dienes, and Ten Horn (2000), adapted to refer to the performance on the specific day. This instrument has also been used in other diary research (Binnewies et al., 2010). The items provide an indirect measure of performance that captures a person's appraisal of his or her performance in comparison with others with similar tasks. As such, it is a measure of perceived performance. The items are "Compared to the standards I got good results from my work today," "I think I deserve a very good evaluation by my boss today," "My performance today is not as good as required" (reverse coded), and "There were no or few complaints about the quality of my work today." The item "Today there were no or only a few complaints about my work" was deleted from the scale, which improved the reliability of the scale significantly. Without this item, Cronbach's alpha ranged between .78 and .89.

RESULTS

We used hierarchical linear modeling with observations on the day-level variables nested within persons (Raudenbush & Bryk, 2002). **Table 1** shows the means, standard deviations, and zero-order correlations of all day-level and person-level variables. To correlate multilevel data, we aggregated the day-level data to the person level.

Day-level predictors were centered around the person mean, and person-level predictors were centered around the grand mean. To assess whether multilevel data analysis was appropriate, we conducted one-way analyses of variance with random effects null models (**Table 2**). The percentage attributable to within-person variability ranged between 51% and 69%. This substantial within-person variation allows for analyzing the data at the daily level using hierarchical linear modeling.

Hypotheses Testing

In total, we estimated four nested multilevel models to predict each of the dependent variables. First, we calculated the respective null models with no predictors and only the dependent variables, for multitasking, affective well-being, and self-rated performance. For each dependent variable some additional models were calculated and compared. In the first models we entered person-level control variables, namely, age, gender, job autonomy, control of time at work, Conscientiousness, and Extraversion. In the second set of models, we added the person-level predictor polychronicity. In the third set of models, we included the day-level predictors. In the fourth set of models we added the moderating effect of polychronicity, represented by the cross-level interaction term of polychronicity and multitasking. This allowed us to assess how polychronicity moderates the within-person change in multitasking and its within-person relationships with well-being and self-rated performance. We tested the predicted improvement of models by means of a chi-square distribution with degrees of freedom equal to the number of parameters added to the model.

Person Predictors of Multitasking

Table 3 displays the results with estimates, standard errors, and *t* values for all variables entered into the models. In Model 1, we entered gender, age, job autonomy, control of time,

TABLE 1
Means, Standard Deviations, and Zero-Order Correlations

	Variable	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
1	Multitasking opportunities	3.04	0.82	—	.494***	.180***	.719***	.017	−.062	.004						
2	Interruptions	2.89	1.08	.582***	—	.662***	.656***	−.050	−.152**	−.061						
3	Unplanned tasks	2.78	1.08	.577***	.774***	—	.604***	−.040	−.188***	−.065						
4	Multitasking	3.23	0.99	.856***	.762***	.703***	—	−.027	−.183***	−.093*						
5	Morning AWB	3.86	0.7	.276**	.046	.112	.227**	—	.602***	.404***						
6	Evening AWB	3.64	0.80	.062	−.101	−.106	.009	.654***	—	.519***						
7	Performance	4.02	0.72	.206**	.033	.113	.107	.378***	.466***	—						
8	Job autonomy	3.75	0.80	.096	−.069	−.118	−.001	.199	.122	.134	—					
9	Polychronicity	2.78	0.55	.428***	.150	.108	.380***	.200	.267**	.109	.172	—				
10	Conscientiousness	3.67	0.49	−.065	−.119	−.009	−.040	.162	−.053	.207*	−.048	.282**	—			
11	Extraversion	3.69	0.68	.053	.155	.136	.166	.001	.160	−.060	−.179	−.085	−.023	—		
12	Control of time	3.75	0.47	−.133	−.224*	−.053	−.145	.220*	.188	.350***	.207*	−.199*	.624***	.111	—	
13	Age	2.33	1.01	.051	.025	−.039	.051	.293**	0.12	.064	.311***	.102	.245*	−.183	.144	—
14	Gender	1.44	0.5	.001	.072	−.027	−.045	−.048	−.021	−.029	−.263**	−.111	.145	.024	.057	−.068

Note. Correlations below the diagonal are person-level correlations ($n = 93$). Correlations above the diagonal are day-level correlations ($n = 418$). AWB = affective well-being.

*$p < .05$. **$p < .01$. ***$p < .001$.

TABLE 2
Variance Component of Null Models for Day-Level Variables

Variable	*Day-Level Variance*	*Person-Level Variance*	*% Variability Within Person*
Multitasking opportunities	0.346	0.318	52.11%
Interruptions	0.671	0.497	57.46%
Unplanned tasks	0.799	0.358	69.05%
Multitasking	0.586	0.390	60.05%
Affective well-being in the evening	0.399	0.236	62.83%
Daily performance	0.327	0.246	57.09%

Conscientiousness, and Extraversion as control variables. Control of time showed a significant negative effect on multitasking ($\gamma = -0.443$, $SE = 0.222$, $t = -1.996$, $p < .05$) and Extraversion was positively related to day-level multitasking ($\gamma = 0.242$, $SE = 0.118$, $t = 2.052$, $p < .05$). The demographic control variables were not related to daily multitasking. The null model showed a better fit than Model 1. Thus, adding control variables to the model did not increase the variance explained in multitasking. In Model 2, we added the person-level predictor polychronicity, explaining a significant amount of variance over Model 1 (difference of $-2^*\log = 10.534$, $df = 1$, $p < .001$). Polychronicity was significantly and positively related to day-level multitasking ($\gamma = 0.529$, $SE = 0.134$, $t = 3.962$, $p < .001$). Thus, H1 stating that individuals who have higher polychronicity engage more in multitasking is supported by the data.

Daily Predictors of Multitasking

In Model 3, we added multitasking opportunities, interruptions, and unplanned tasks. We included random effects for Level 1 and 2 in all models. Multitasking opportunities showed a positive relation to day-level multitasking ($\gamma = 0.330$, $SE = 0.073$, $t = 4.516$, $p < .001$).

Therefore, H2, stating that daily multitasking opportunities increase the likelihood of the behavior, was supported. Moreover, H3, predicting that interruptions ($\gamma = 0.186$, $SE = 0.051$, $t = 3.663$, $p < .001$) and unplanned tasks ($\gamma = 0.278$, $SE = 0.047$, $t = 5.913$, $p < .001$) during the day are positively related to multitasking, was supported. Overall, Model 3 that included all day-level predictors of multitasking was significantly better than Model 2 (difference of $-2^*\log = 253.408$, $df = 1$, $p < .001$). Thus, daily changing opportunities to multitask and the extent of unplanned tasks and interruptions during the day are significantly related to daily multitasking, in addition to the person-level variables.

Multitasking and Affective Well-Being

H4 predicts a negative relationship between day-level multitasking and affective well-being in the evening. Again, we calculated sets of models (see **Table 4**). In the first model, gender, age, job autonomy, control of time at work, Conscientiousness, and Extraversion were included as control variables. Only control of time at work was positively related to affective well-being in the evening ($\gamma = 0.381$, $SE = 0.172$, $t = 2.218$, $p < .05$) and Conscientiousness was negatively related to it ($\gamma = -0.347$, $SE = 0.165$, $t = -2.099$, $p < .05$). In Model 2, we entered polychronicity.

TABLE 3
Multilevel Estimates for Models Predicting Multitasking

	Null Model			*Model 1*			*Model 2*			*Model 3*		
Variable	*Estimate*	*SE*	*t*	*Estimate*	*SE*	*t*	*Estimate*	*SE*	*t*	*Estimate*	*SE*	*t*
Intercept	3.232	0.075	42.964	3.232	0.075	43.317	3.233	0.069	46.870	3.233	0.068	47.592
Gender				−0.037	0.160	−0.23	−0.031	0.148	−0.211	−0.091	0.124	−0.735
Age				0.054	0.082	0.657	0.024	0.077	0.311	0.042	0.064	0.657
Job autonomy				0.080	0.114	0.701	0.021	0.106	0.194	0.009	0.090	0.099
Control of time				−0.443	0.222	−1.996*	−0.405	0.205	−1.969	−0.227	0.176	−1.285
Conscientiousness				0.210	0.214	0.983	0.359	0.201	1.787	0.244	0.169	1.449
Extraversion				0.242	0.118	2.052*	0.236	0.109	2.161*	0.261	0.093	2.796**
Polychronicity							0.529	0.134	3.962***	0.516	0.113	4.559***
Multitasking opportunities										0.330	0.073	4.516***
Unplanned tasks										0.278	0.047	5.913***
Interruptions										0.186	0.051	3.663***
−2 × log			1090.5334			1096.6680			1086.1345			832.7265
Diff −2 × log						−6.1346			10.5335**			253.408***
df						6			1			2
Level 1: intercept variance (SE)		0.5858	(0.7654)		0.5861	(0.7656)		0.5858	(0.7654)		0.2059	(0.6169)
Level 2: intercept variance (SE)		0.3898	(0.6243)		0.3812	(0.6174)		0.3066	(0.5537)		0.3806	(0.4538)

*$p < .05$. **$p < .01$. ***$p < .001$.

TABLE 4
Multilevel Estimates for Models Predicting Affective Well-Being in the Evening

	Null Model			*Model 1*			*Model 2*			*Model 3*			*Model 4*		
Variable	*Estimate*	*SE*	*t*	*Estimate*	*SE*	*t*	*Estimate*	*SE*	*t*	*Estimate*	*SE*	*t*	*Estimate*	*SE*	*t*
Intercept	3.646	0.059	61.330	3.376	0.237	14.228	3.408	0.231	14.781	3.385	0.215	15.774	3.390	0.214	15.807
Gender				0.038	0.124	0.309	0.041	0.120	0.343	0.032	0.112	0.287	0.026	0.112	0.229
Age				0.092	0.064	1.442	0.077	0.062	1.235	0.092	0.057	1.601	0.094	0.057	1.639
Job autonomy				0.015	0.088	0.175	−0.016	0.086	−0.186	−0.056	0.080	−0.703	−0.063	0.080	−0.785
Control of time at work				0.381	0.172	2.218*	0.402	0.167	2.405*	0.383	0.156	2.458*	0.382	0.156	2.446*
Conscientiousness				−0.347	0.165	−2.099*	−0.272	0.163	−1.666	−0.269	0.152	−1.767	−0.269	0.152	−1.765
Extraversion				0.130	0.092	1.418	0.126	0.089	1.423	0.129	0.083	1.556	0.124	0.083	1.494
Polychronicity							0.272	0.109	2.506**	0.187	0.101	1.858	0.275	0.107	2.57**
Day level Multitasking										−0.181	0.062	−2.923**	−0.159	0.060	−2.658**
Polychronicity X Day level Multitasking													0.272	0.105	2.588**
−2 × log			922.546			927.597			925.919			772.938			771.237
Diff −2 × log						−5.051			1.678			152.981***			1.701
df						6			1			1			1
Level 1: intercept variance (SE)		0.3990	(0.6317)		0.3986	(0.6313)		0.3987	(0.6314)		0.2107	(0.4590)		0.2118	(0.4603)
Level 2: intercept variance (SE)		0.2360	(0.4858)		0.2182	(0.4671)	0.2002	(0.4474)	0.2402	(0.4901)		0.2383	(0.4882)		

*$p < .05$. **$p < .01$. ***$p < .001$.

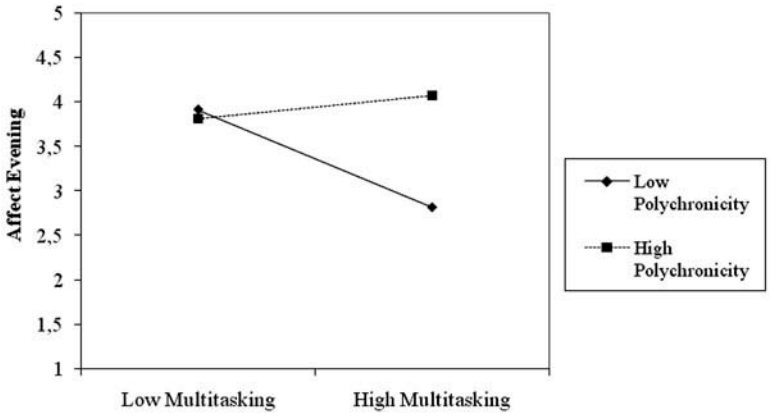

FIGURE 2 Interaction between polychronicity and multitasking for affective well-being in the evening.

It was significantly and positively related to affective well-being in the evening ($\gamma = 0.272$, $SE = 0.109$, $t = 2.506$, $p < .01$), but adding this variable did not improve the variance explained in comparison to the previous model (difference of $-2^*\log = 1.678$, $df = 1$, *ns*). To test H4, we entered day-level multitasking. As predicted, day-level multitasking was negatively related to affective well-being in the evening ($\gamma = -0.181$, $SE = 0.062$, $t = -2.923$, $p < .01$) and Model 3 was significantly better than Model 2 (difference of $-2^*\log = 152.981$, $df = 1$, $p < .001$). In Model 4, we tested the moderating effect of polychronicity on the relationship between multitasking on affect, as proposed in H5. Although the interaction effect ($\gamma = 0.272$, SE $= 0.105$, $t = 2.588$, $p < .01$), day-level multitasking ($\gamma = -0.159$, $SE = 0.060$, $t = -2.658$, $p < .01$), and polychronicity ($\gamma = 0.275$, $SE = 0.107$, $t = 2.57$, $p < .01$) were significant predictors of affective well-being in the evening, there was no significant improvement between Model 3 and Model 4 (difference of $-2^*\log = 1.70$, $df = 1$, *ns*). The moderating effect is depicted in **Figure 2**. Aalthough there is almost no difference in affective well-being in the evening if day-level multitasking is low, affective well-being is considerably lower if polychronicity is low and day-level multitasking is high.

Multitasking and Performance

H6 states that there is a negative effect of day-level multitasking on performance. Again, we calculated four models to assess the effect of multitasking on self-rated performance (see **Table 5**). The control variables that we entered in Model 1 were nonsignificant, except control of time ($\gamma = 0.535$, $SE = 0.167$, $t = 3.197$, $p < .01$). In Model 2, we added polychronicity that was significantly and positively related to performance ($\gamma = 0.268$, $SE = 0.105$, $t = 2.541$, $p < .01$). However, Model 2 was not significantly better than Model 1. When we added multitasking in Model 3 there was a significant improvement (difference of $-2^*\log = 146.326$, $df = 1$, $p < .001$). Multitasking was negatively related to performance supporting H6. Next, we tested whether polychronicity moderated the relationship between multitasking and performance. Model 4 shows that multitasking ($\gamma = -0.111$, $SE = 0.052$, $t = -2.129$, $p < .05$), polychronicity ($\gamma = 0.243$, $SE = 0.104$, $t = 3.197$, $p < .05$), and their interaction ($\gamma = 0.361$, $SE = 0.091$, $t = 3.950$,

TABLE 5
Multilevel Estimates for Models Predicting Performance

	NNull Model			*Model 1*			*Model 2*			*Model 3*			*Model 4*		
Variable	*Estimate*	*SE*	*t*	*Estimate*	*SE*	*t*	*Estimate*	*SE*	*t*	*Estimate*	*SE*	*t*	*Estimate*	*SE*	*t*
Intercept	3.998	0.059	67.968	4.042	0.231	17.506	4.076	0.224	18.194	4.029	0.218	18.524	4.034	0.215	18.752
Gender				−0.021	0.120	−0.175	−0.020	0.117	−0.167	−0.003	0.113	−0.028	−0.015	0.112	−0.13
Age				−0.006	0.062	−0.1	−0.021	0.060	−0.353	−0.012	0.058	−0.197	−0.006	0.058	−0.111
Job autonomy				−0.021	0.086	−0.24	−0.051	0.084	−0.612	−0.039	0.081	−0.477	−0.044	0.080	−0.551
Control of time				0.535	0.167	3.197**	0.556	0.162	3.426***	0.559	0.158	3.538***	0.556	0.156	3.556***
Conscientiousness				−0.111	0.161	−0.689	−0.036	0.159	−0.229	−0.089	0.154	−0.58	−0.099	0.153	−0.647
Extraversion				−0.117	0.089	−1.318	−0.121	0.086	−1.4	−0.120	0.084	−1.435	−0.126	0.083	−1.519
Polychronicity							0.268	0.105	2.541**	0.169	0.102	1.654	0.243	0.104	2.33*
Multitasking										−0.137	0.057	−2.4**	−0.111	0.052	−2.129*
Polychronicity × Multitasking													0.361	0.091	3.95***
−2 × log			855.318			857.705			855.931			709.605			700.921
Diff −2 log						−2.387			1.774			146.326***			8.684**
df						6			1			1			1
Level 1: intercept variance (SE)		0.3265	(0.5714)		0.3263	(0.5712)		0.3264	(0.5714)		0.1716	(0.4142)		0.1736	(0.4166)
Level 2: intercept variance (SE)		0.2456	(0.4955)		0.2182	(0.4671)		0.2001	(0.4473)		0.2337	(0.4834)		0.2316	(0.4812)

*$p < .05$. **$p < .01$. ***$p < .001$.

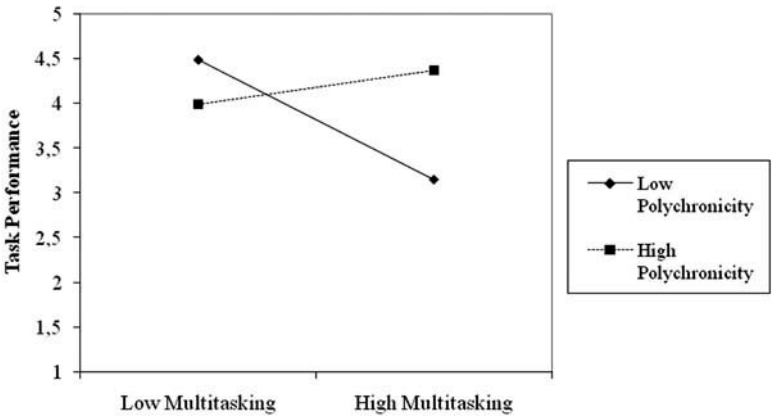

FIGURE 3 Interaction between polychronicity and multitasking for performance.

$p < .001$) were all significantly related to performance in the hypothesized direction. Model 4 was significantly better than Model 3 (difference of $-2^*\log = 8.684$, $df = 1$, $p < .01$). As depicted in **Figure 3**, performance was highest when multitasking and polychronicity were low. The worst performance was related to high multitasking and low polychronicity. Thus, we found support for the moderating effect of polychronicity on the within-person relationship between multitasking and performance as stated in H7.

Person-Level Control Variables

The control variables age and gender were not significant predictors in any of the models that we ran. Thus, we cannot support the popular assumption that there are gender differences in multitasking. Furthermore, there were no significant differences between men and women in polychronicity, $F(1, 100) = 1.256$, $p = .265$.

DISCUSSION

Generally, the data supported our hypotheses. There was considerable variation of multitasking across the days, showing the difference between multitasking as a dynamic phenomenon that occurs within persons. We showed that people engage in multitasking for different reasons, although the degree of multitasking also reflects polychronicity, that is, the preference for multitasking. As Poposki and Oswald (2010) argued, work requirements and personality can influence polychronicity as well as multitasking. Our results show that multitasking opportunities, interruptions, and unplanned tasks predicted multitasking. This suggests that the degree of multitasking is determined by the external demands, interruptions, and unplanned tasks inherent in the actual work setting. In the specific context investigated in our study, the daily work demands explained more variance in multitasking than the level of polychronicity. Notwithstanding the

commonly assumed positive effects associated with multitasking, our study shows that multitasking goes together with lower self-rated performance and with lower affective well-being, particularly when the preference for multitasking is low. The results bear a number of theoretical and practical implications.

Theoretical Implications

In the past, polychronicity has sometimes been equated to multitasking, a practice that has been criticized on conceptual grounds (König & Waller, 2010; Poposki & Oswald, 2010). Our empirical analysis confirms the position of these authors that polychronicity is related but not identical to multitasking. As a personal characteristic, polychronicity is conceived to be stable over time, but multitasking changes from day to day. These changes do not seem incidental; they show a linear trend over the days of the week, which is congruent with trends in antecedents and consequences.

An interesting finding from our study is that the consequences are on average negative, that is, on days with more multitasking lower well-being and self-rated performance were observed. This is in line with the observation that multitasking can impair affect, increase stress, and lower performance (Langfred & Moye, 2004; Offer & Schneider, 2011) and runs against the general belief that multitasking leads to better performance and makes work more attractive, as it adds to variety, autonomy, and flexibility. We propose four reasons for these seemingly contradicting results.

First, former studies have often examined multitasking from a differential instead of a temporal angle and produced evidence about between-person relationships that is irrelevant for within-person relations over time (Molenaar et al., 2003). Second, many studies of multitasking have been done in university laboratories and examined cognitive tasks lasting minutes rather than real work tasks lasting hours. We measured workers' multitasking and the consequences with regard to work tasks at the level of the workday. Third, there are some studies of multitasking at the workplace that have treated the construct as an ability or a typical behavior that characterizes individuals and shows little or no change over time. Our results indicate substantial variation within persons over time. This suggests that future research should not assume that multitasking is stable, but should rather investigate variations across days, and should determine to which degree the differences are compatible with the notion of multitasking ability. Fourth, some studies took polychronicity as a proxy of actual multitasking, which can also result in contradicting findings.

It is clear from our study that the degree of multitasking shown by a person at a certain moment depends on both external demands of that moment and a general personal preference. Employees who are confronted with many interruptions and unplanned tasks are normally expected to respond to them in one way or another, and multitasking is one of the ways they can opt for. Thus, carrying out parts of the tasks simultaneously and switching in-between to make optimal use of personal and workplace resources is a means to deal with disruptive factors that are beyond people's control. Opportunities for multitasking or interruptions cannot be equated to multitasking itself, though. Employees may engage in multitasking even when they are not required to do so because of external demands. There is an aspect of volition in multitasking that is indirectly addressed in this article by showing the moderating effect of polychronicity. However, further attention should be paid to voluntary versus required multitasking (Spink et al., 2008), and the different effect that they might have on well-being or performance.

Practical Implications

Considering variable work demands, the need for flexibility, and high work pace at the contemporary workplace, a certain degree of multitasking is inevitable—multitasking is not only a matter of choice but also a matter of necessity. However, there are limits to what can be done within a certain period. This is even so in the domain of computing from which the concept "multitasking" originated: Simultaneous processing of tasks by a computer is only possible to a limited extent, and scheduling is needed to execute all tasks properly. If there are too many simultaneous processes, programs may jam due to limited storage and the computer may crash. Humans have limited capacities as well and cannot process too many tasks simultaneously (Wickens & McCarley, 2008). As the human brain struggles to process multiple tasks in parallel, there are negative effects on work results as well as on well-being. Thus, employees who are confronted with multiple tasks and goals need to engage in scheduling, prioritizing, postponing, and decision making to avoid negative consequences on work performance and individual affective outcomes.

Interruptions are antecedents of multitasking in that they force employees to stop working on their focal task. Resuming work after an interruption carries cognitive costs in that employees need to reorient themselves (Mark, Gonzalez, & Harris, 2005; Zijlstra et al., 1999). When many interruptions occur during the workday, the cognitive costs accumulate, which can lead to overload, making employees lose track of the state of tasks. Simply put, employees end up asking themselves, "Where was I?" To limit this source of multitasking and its related negative consequences, management should decrease unwanted interruptions where possible.

The negative relation of daily multitasking with affective well-being and daily performance stands in sharp contrast to the positive connotation generally associated with multitasking in the business world. Thus, managers should be careful asking employees to engage in high levels of multitasking, as this could actually backfire, particularly if employees are monochronic. Our results show that people who are highly polychronic do not suffer from multitasking as much as people having a preference for monochronic working. Thus, employers should recruit employees with high polychronicity for jobs in which multitasking is essential.

Polychronicity has been treated as a general and stable preference of people. In contrast to this assumption, König and Waller (2010) argued by means of cognitive dissonance theory (Festinger, 1957) that polychronicity can change over time to match the multitasking demands stemming from the work environment. In other words, employees may "learn to love" multitasking if they are constantly confronted with high levels of multitasking opportunities. If polychronicity can change due to external demands, this could mean that the detrimental effects of multitasking could be lessened. In one study, polychronicity was found to significantly change over time (Li, Waller, & Roe, 2008). However, the scale used was partly reflecting activities and not just preferences. Thus, more research is needed to establish whether polychronicity may change over time and at what rate.

Britton and Tesser (1991) stated that people can use multitasking as a time management tool in handling multiple task demands. Along the same line, others have argued that multitasking can be a coping behavior to handle work load in groups (Waller, Conte, Gibson, & Carpenter, 2001). This does not imply that multitasking will have positive rather than negative effects but rather that employees could learn how to minimizing the negative impacts. Future research on time management training could look into multitasking strategies in addition to gaining more control over disruptive factors at work such as unplanned tasks and interruptions—which would

reduce the need for multitasking. It would also be worth examining the effects of training employees to refrain from multitasking, if not indispensable. There might well be a positive effect on affective well-being in the evening and performance at work. Previous studies found that time management training increases job satisfaction, control of time at work, and health and decreases procrastination at work, worry, and stress (Claessens, Van Eerde, Rutte, & Roe, 2007; Van Eerde, 2003). Time management was positively related to supervisors' ratings of employee performance (Macan, 1996).

Limitations

A strength but also a limitation of this study is its temporal scope. We have looked at multitasking as happening in single working days using measurements from 5 consecutive days. This gives an insight into multitasking that was lacking from previous studies, but it does not show the occurrence and effects of multitasking over longer time spans. It is well conceivable that variable degrees of multitasking—with highs and lows over many days—or high levels of multitasking over extended periods would have different effects on performance and well-being. Research with different time windows, from hours to months, may improve our understanding of multitasking and may clarify when multitasking has positive or negative outcomes. A second limitation is that our HLM analyses assume the trajectories of multitasking, as well as antecedents and outcomes, to be linear. Although this is a common assumption in longitudinal research using HLM, it may well be that changes are not linear and that upward and downward variations occur, particularly if longer time frames are considered. This is also something to be addressed in future research. A third limitation is that polychronicity has been assumed to be stable. Although this is in line with the theory as advanced by Slocombe and Bluedorn (1999), there are indications that polychronicity is open to changes over time. Thus it would be worth investigating in a multilevel design that uses days (or other episodes) nested within persons.

A fourth limitation has to do with the generalizability of our findings. We have studied subjects in a variety of (white-collar) jobs in Germany in the year 2010, that is, within a particular work ecology bounded in time and space. Within these general limits we recruited participants from different organizations with diverse job descriptions, to make sure that our findings would not be limited to a specific type of work. In addition, we controlled for managerial position, age, gender, tenure, and job characteristics such as job autonomy to disentangle the effects that diverse types of work might have on multitasking, as well as on associated antecedents and outcomes. We are aware that not all types of work will necessarily show negative effects of multitasking on affective well-being and performance. For instance, it has been shown that for creative tasks, breaks may be beneficial to avoid impasses (Beeftink, Van Eerde, & Rutte, 2008), which suggests that the resumption of tasks may sometimes be beneficial as new ideas emerge and a fresh look is taken at the focal task. Even if the relationships identified in our study would appear among employees in other jobs, in similar work environments, we would not claim that they would extend to work in other (e.g., more dynamic) ecologies and that they would continue to hold in later periods. We hope that our study, which was the first to address multitasking at the level of the workday across a single workweek, will inspire other researchers to conduct similar research. This would give a better insight in multitasking and make clear which aspects of our findings are generalizable or not. A fifth limitation concerns the low alpha coefficient of the scale for Conscientiousness. The results for this control variable may change if it is assessed more reliably.

A final issue is that our data are based on self-report and stem from the same source, which makes them vulnerable to common-source bias. Polychronicity and affective well-being are subjective phenomena that would be hard to assess via other sources than self-report. For measuring performance one would generally prefer objective measures or supervisor ratings, although the latter have their own limitations. In this study, where people in different jobs and organizations are involved and each fulfills a unique set of tasks that unfolds over time in a completely idiosyncratic manner, neither objective measures nor supervisor ratings could possibly be obtained. Therefore, we adopted a method that is based on self-report but asks the person to compare with general performance expectations at the workplace (Roe et al., 2000). We acknowledge that it is a general self-assessment, which does not reveal whether specific tasks or goals have accomplished or which progress was made regarding different performance dimensions, such as quality and quantity. To counteract possible bias in self-assessments, we guaranteed participants confidentiality, used short questions, and included reversed coded items in the scales. Moreover, we used person mean centering for day-level variables and measured the constructs at two different points in time to reduce common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

CONCLUSION

In this study we investigated multitasking and related it to polychronicity, which both seem indispensible at the modern workplace. We have demonstrated that multitasking is related to but also different from polychronicity. Whereas polychronicity is a preference, multitasking is a behavior that changes at the day level depending on opportunities, interruptions, and unplanned tasks at work.

Our findings show that across working days, a greater degree of multitasking is associated with less affective well-being in the evening and lower self-rated performance. These results are in line with findings from cognitive psychology showing switching costs, such as higher error rates and increased response time. However, our study relates to multitasking as a behavior observable during the days people spend at the workplace work and not only in microseconds in the laboratory. Polychronicity seems to "absorb" the negative consequences of multitasking on performance and affective well-being to a large extent. Therefore, employers relying on multitasking should consider employees' polychronicity in order to prevent lower performance and negative affective well-being. This might be of special importance, as negative affective well-being may have a cumulative impact on performance over time. The high demands on self-regulation and cognitive resources needed to multitask on a daily basis may lead to burnout symptoms, reduced job satisfaction, and lowered commitment, and this may result in worsened performance.

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