

Perceived Control of Time:
Time Management and Personal Effectiveness at Work

Brigitte J.C. Claessens

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PROEFSCHRIFT

ter verkrijging van de graad van doctor aan de Technische Universiteit Eindhoven,
op gezag van Rector Magnificus, prof.dr. R.A. van Santen, voor een commissie aangewezen
door het College voor Promoties in het openbaar te verdedigen op
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door

Brigitte Johanna Catharine Claessens

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prof.dr. R.A. Roe

Copromotor:
dr. W. van Eerde

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When I first started work on my PhD I had mixed feelings. On the one hand I knew it would be a very rich experience, giving my knowledge and professional skills greater breadth and depth; on the other hand it was likely to be a project lasting four years, which at the outset seemed like an eternity. Prior to my PhD I had been used to working on projects spanning weeks or months, and here I was at the beginning of something that could take several years to complete. Naturally I wondered whether I would be able to perform a project that would take several years, would I be able to maintain my interest and stay the course? To allay some of these fears I laid out a detailed project plan for my PhD, hoping to get some insight into the component parts and the timing thereof. In my optimistic view, I could get everything completed in three years. When presenting this plan to my promotors, Christel and Rob, and co-promotor, Wendelien, it resulted in considerable amusement on their part, although they had to admit they had rarely seen such detailed planning. Of course, I discovered for myself during the course of my PhD that the best laid plans can always come undone, for many reasons, unforeseen circumstances and work interruptions included. Besides my personal experience, it was interesting to discover during the course of my studies that other people had to deal with the same, or other, time management issues. Moreover, managing time at work was not as easy as it would seem, and many factors, both personal and work-related, appeared to be involved. To study time management and some of its many aspects. I certainly needed the four years of my PhD. I can honestly say that there was never a dull moment, I enjoyed all of it and learned a lot.

I owe much gratitude to many people, and would like to express my appreciation for all the help I had along the way. Thanks to my promotors, Christel and Rob, and co-promotor Wendelien for all the support, patience and humor that they provided, which was all needed to complete my project (almost) on time. Thanks to Marcel Croon, Harry Garst, and Ad de Jong for their statistical advice. Thanks to all the organizations that participated and provided input for my studies, and a special thanks for Martin F. Ooms Managementbureau who helped me recruit organizations to take part in my research. I also owe great thanks to my HPM-colleagues, in particular Anniek van Bemmelen, Ad Kleingeld, Miranda Peeters, Floor Beeftink, Erik van der Geer. Many thanks to Josette Gevers, who I shared an office with for

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Brigitte Claessens

August, 2004

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Introduction

“What did I do today, where did my time go to?”

“I never seem to have enough time to complete my work”

Nowadays, these remarks are quite common among employees. These remarks reflect the individual's focus on time at work and the problems associated with it. Apparently, being in control of one's time is important to employees.

Issues of time and timing have become more and more essential to managers and employees. Especially in the last two decades, as a result of expanding global competition and increased demands for immediate availability of products and services, the temporal dimension of work has become more important (Orlikowsky and Yates, 2002). Also, people report an increased pace of life as expressed in doing things faster (acceleration), contracting time expenditure (e.g., eat faster, sleep less), and compressing actions (making a phone call while having lunch) (Garhammer, 2002). In contrast to the large amount of literature on the philosophical aspects of time, there has been a relative lack of scientific literature on temporal issues in organizations (Bluedorn, 2002; Bluedorn and Denhardt, 1988). Moreover, literature on how individuals deal with time at work is relatively scarce when compared to the popular attention for time issues at work. This dissertation addresses one line of research with respect to individual time-issues at the job: time management.

Time management was introduced at the end of the 1950s as a method for effectively coping with time issues on the job (e.g., Drucker 1967; MacKenzie, 1959). The method consists of tips and techniques to determine which goals to pursue in the short term, how to translate these goals into tasks and activities to be performed immediately, how to plan and prioritize them on a daily basis, and how to avoid work interruptions that distract from executing these tasks. Since its introduction, there has been tremendous popular attention for the implementation of time management techniques at work and time management training programs. Nowadays, there are many books, articles, seminars, workshops, and general time management tips available and the large numbers of people have participated in time management training programs in some way. The popularity of time management is also expressed for instance in the 1.750.000 hits on ‘time management’ in an internet search. Time management is still a ‘booming business’ with large amounts of money going around.

Partly because of the popularity of the time management concept, time management techniques are commonly assumed to be highly effective. One would expect to find evidence of a positive relation between the adoption of time management techniques and job performance in the scientific research literature and one would expect that particular time management techniques had been developed on the basis of these studies. Surprisingly, a

review of the scientific literature on time management (Chapter 2) however, revealed that relatively few studies have been conducted on the effects of time management behaviors at work and the effects of time management training programs in particular.

Macan (1994) was the first and to date the only one to suggest and test a theoretical process model of time management. She suggested that time management training positively affects time management behavior, which in turn enhances one's perceived control of time by which outcomes such as job satisfaction are positively affected. Thus, according to Macan (1994), the main outcome of the engagement in these time management behaviors is perceived control of time. As Macan (1994, p. 382) puts it: "By setting goals, scheduling, and organizing one's time, one gains a sense of mastery over how one allocates one's time, that is, the perception that one has control over one's time".

However, as research found little support for the model, we aimed at the further theoretical modeling of time management in order to understand and explain how individuals deal with time at work. From a practical perspective, this knowledge may be used to design effective time management interventions, such as training programs, to teach people how to increase their work performance and effectiveness in order to deal with the demands of the current work situation.

Research goals

The main goal of this dissertation is to further develop and test theoretical models of time management in order to extend knowledge in the time management domain. A second goal is to investigate the processes of planning and executing daily work tasks in more detail, and to identify issues for which time management behaviors can possibly be a solution.

The time management model we employed in this dissertation was derived from Macan (1994) and further developed on the basis of several lines of research: research on action regulation (e.g., Hacker, 1985), and self-regulation research (e.g., Carver & Scheier, 1998). The model is presented in Figure 1.

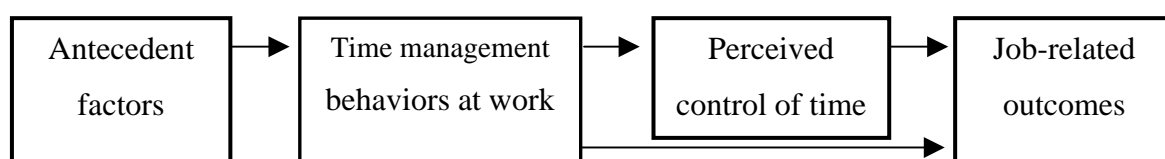


Figure 1. General conceptual model of time management that underlies this dissertation

As can be seen in Figure 1, we propose that time management behaviors at work lead to perceived control of time which in turn affects job-related outcomes. Additionally, we propose a direct effect of time management behaviors on job-related outcomes. Antecedent factors of time management in this dissertation include time management training and personality characteristics. More specifically, we propose that time management behaviors at work consist of three types of behaviors, namely behaviors involving time awareness behaviors, planning behaviors, and monitoring behaviors. These behaviors affect a person's perceived control of time, which refers to the feeling that one is in control with respect to how time at work is spent. In other words, it reflects the extent to which one feels that one has the time in the work situation in hand. Perceived control of time in turn affects job-related outcomes, but we also expect direct effects of these behaviors on job related outcomes. The job-related outcomes in the studies presented in this thesis can be divided into performance outcomes (job performance, effectiveness) and well-being outcomes (job satisfaction, work strain, psychosomatic health complaints).

In the chapters of this dissertation, the research on different parts of the model are presented. In some studies we have incorporated notions from other lines of research, such as Karasek's (1998) job-demand-control model, in order to explore ways to improve our understanding of the effects of time management. We firstly present a review of the time management literature in the work domain that discusses past time management studies, demonstrates the gaps in research and gives indications for future research. Additionally, a new definition of the time management concept is presented. Secondly, two mediation models of the relationship between time management behaviors and outcomes are presented. In the first model, Macan's work is challenged by the inclusion of two job characteristics and the application of a longitudinal design. In this way, the unique contribution of one type of time management behavior (i.e., planning behavior) and job characteristics could be studied, and the direction of the relationship with outcomes could be determined as an indication of its causal relation. It was hypothesized that planning behavior added to job characteristics in predicting perceived control of time and outcomes (i.e., job performance and job satisfaction). The second model challenges earlier work in three ways. First, more time management behaviors were included as independent variables, secondly, the relation of the mediator, perceived control of time, and a theoretically related construct, i.e., occupational self-efficacy, was investigated in order to establish its unique contribution, and thirdly, more performance and well-being outcomes were included, among others, by adding supervisor and colleague ratings. Thirdly, two studies on the planning and executing process of daily work tasks are presented that examined individual differences in planning tasks and the

completion of work as planned. It was expected that task characteristics (such as task priority) would influence the completion of planned tasks over and above personal and job characteristics. Finally, individual pacing styles were investigated in relation to time management behaviors, perceived control of time, occupational self-efficacy, and several performance outcomes.

Dissertation outline

Data were gathered in a total of eight (service- and production) companies in the Netherlands. Chapter 3 presents a survey study with data gathered in two waves conducted in one company. Chapter 4 presents a diary and survey study conducted in one company and interviews conducted in seven companies. Chapter 5 and 6 are based on a large survey study conducted in seven companies. In Chapter 7, the general conclusions and discussion are presented. Although the chapters build upon each other, they can be read independently.

Chapter 2

In the second chapter, a review of the literature on the empirical studies on time management is presented. This review described the state of affairs in research, discusses the research methods that were used, and gives directions for future research. This chapter refers to all parts of our proposed theoretical model of time management.

Chapter 3

In chapter three, a mediation model of one time management behavior; i.e., planning behavior, is presented. This model addresses the relationship between planning behavior and outcome variables (such as job performance) over time, which is partially mediated by perceived control of time. The model also addresses the importance of job characteristics (perceived workload and job autonomy) in addition to planning behavior. A longitudinal design was used to study the effects of planning behavior and job characteristics on the perceived control of time and job-related outcomes. In this way, we were able to study the effects of planning behavior over time.

Chapter 4

The fourth chapter focuses on the planning and executing process in detail. It first presents the results of a diary study and a survey study conducted in order to investigate the process of planning and executing daily work tasks. In the second part of this chapter, results of an interview study are presented in which preparing for action, the planning and prioritizing process, and workday start-up behaviors are explored in more detail. This chapter discusses the relation between antecedent factors, planning behavior and job-related outcomes of our theoretical model.

Chapter 5

The fifth chapter is an extension and modification of the mediation model presented in chapter 3. The mediation model in this chapter covers elements of the three time management behaviors presented in our theoretical model, i.e., task assessment behavior, planning behavior, and time-monitoring behavior. The study included three aspects of planning behavior, i.e. anchored planning, priority focus, and contingency planning. Also, the unique contribution of perceived control of time in relation to a theoretically related construct, i.e., occupational self-efficacy was investigated. This chapter investigates the relations between time management behaviors, perceived control of time and job-related outcomes of our theoretical model.

Chapter 6

In chapter six, we present a different view of time management. We distinguish five different pacing styles with respect to the distribution of activities over time and investigate its relation to time management behaviors and performance outcomes of work. This chapter focuses on the relations between antecedent factors, time management behaviors, perceived control of time and performance outcomes of our theoretical model.

Chapter 7

In the final chapter, the results of the various chapters are summarized and related to the proposed theoretical model. Our findings are discussed, limitations of the research presented in this dissertation, directions for future research, and practical implications are presented.

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A Review of the Time Management Literature*

Despite the popularity of time management, relatively little scientific research has focused on the way in which people manage their time and on the processes involved. This review of the literature included 32 empirical time management studies conducted between 1982 and 2004. Results showed that time management was a poorly defined concept; hence a new definition is proposed. The review demonstrated that time management behaviors were generally found to have a positive effect on perceived control of time, job satisfaction, stress reduction, job or academic performance, and health, although results were sometimes contradictory. Some evidence for individual differences in time management was found. Time management training has been shown to enhance time management skills, but only some studies found a relation with outcomes such as job performance.

* This chapter is based on: Claessens, B.J.C., van Eerde, W., Rutte, C.G., & Roe, R.A. A review of the time management literature. Manuscript submitted for publication.

During the last two decades, there has been a growing recognition of the importance of time in the organizational literature. According to Orlikowsky and Yates (2002), the temporal dimension of work has become more important because of expanding global competition and increased demands for immediate availability of products and services. Garhammer (2002) pointed at the increased pace of life which displays by doing things faster (acceleration), contracting time expenditure (e.g., eat faster, sleep less), and compressing actions (making a phone call while having lunch). Several studies acknowledged experienced time pressure among employees (e.g., Jackson & Martin, 1996; Major, Klein, & Ehrhart, 2002; Teuchmann, Totterdell, & Parker, 1999).

The increasing salience of time is reflected in theoretical as well as practical publications. A number of authors discussed the need for better incorporating time in theoretical models and research designs (e.g., Ancona, Goodman, Lawrence, & Tushman, 2001; George & Jones, 2000; Wright, 2002). Others focused on the ways in which people in organizations manage their time, and on ways in which their efforts can be improved (e.g., Macan, 1994). This article addresses time from the second perspective. Our aim is to review the empirical studies on time management in order to summarize the current state of the art in this field. More specifically, our aim is to review definitions of time management, to discuss methods for studying time management, to summarize empirical findings on time management and the use and effectiveness of time management methods, to identify gaps in the current research literature, and to give suggestions for future research.

Time management is by no means a new concept. The problem of how to manage time was already discussed in the 1950s and 1960s, and several authors proposed methods on how to handle time issues on the job (e.g., Drucker 1967; Lakein, 1974; MacKenzie, 1954; McCay, 1959). They suggested simple remedies such as writing work plans down on paper (so-called to-do lists) in order to increase one's job performance. At the same time, some authors (e.g., Drucker, 1967) recognized that planning tasks and activities does not always lead to the completion of planned work, especially when time pressure is high.

MacKenzie (1954) developed a concept for a time management training program, which is still being used. Time management training programs are aimed at giving insight into time-consuming activities, changing time expenditure, and increasing workday efficiency by teaching people how to make a daily planning, how to prioritize tasks, and how to handle unexpected tasks. Books, articles, and time management training programs that were initially developed for managers have been made available to everyone.

The term 'Time management' is actually misleading. Time, in fact, cannot be managed, because time is an invariable factor. Only the way a person deals with time can be

influenced. Time management can be viewed as a way of monitoring and controlling time (e.g., Eilam & Aharon, 2003). In this regard, it would be more appropriate to speak about self-management with regard to working on multiple tasks within a certain time period. In the literature, self-management has a different meaning. It refers to monitoring and regulating oneself, but techniques to monitor time use have not been addressed specifically. Therefore, we will stick to the use of the term time management in the present paper.

In spite of all popular attention to managing time, relatively little research has been conducted on factors that are involved in the efficient process aimed at making the best use of one's time (e.g., by using one's prime time to complete important tasks) and completing work in time.

In 1987, a review was published that examined the increasing popularity of time management (Richards, 1987). It discussed the principles mentioned by popular authors like MacKenzie (1954) and concluded that for instance setting life goals and keeping time logs were important techniques aimed at effectively managing one's time. Although this article was helpful in understanding the ideas behind the popular notion of time management, it was not a review of empirical time management studies. To our knowledge no reviews of empirical research of time management have been published since the article by Richards (1987). Therefore, the first goal of the present study is to review past empirical studies on time management to determine the state of affairs in this area of research. We will review the way in which researchers have incorporated time management concepts and methods in their research and critically discuss the research designs they used. Questions to be addressed are: What is time management behavior? What are its antecedents? What is the impact of these behaviors on outcome variables (such as health and job performance)? Our second goal is to determine in which areas more research is needed in order to extend the present knowledge of time management and the processes involved.

Method

Selection of studies

Empirical studies on time management published between 1954 (when time management was introduced) and 2004 were found through PsycInfo, Sociofile, and references of past studies. Query terms included time management, time use, time allocation, and time structuring. A first criterion for the selection of studies was that time management had been related to study or work situations. Quite a few studies dealt with topics like rehabilitation after an injury or accident, geriatrics, and other medical conditions (for

example, Sakelaris, 1999), which fell outside the scope of our study. The second criterion was that time management behavior or attitudes had been measured by means of instruments constructed for this purpose. In some studies (e.g., Sweidel, 1996), time management was measured post hoc by combining some items that were more or less related to time management, rather than by means of validated scales to measure time management. Results were therefore questionable and were not included in this review study.

Using the two criteria, 32 empirical studies were selected for inclusion in this review.

We will discuss these studies by presenting the theoretical contributions made, the definition of time management used, the measurement scales, the results, gaps in research, and suggestions for future research.

Results

In Table 1, the studies included, the samples, methods, questionnaires, and variables used are presented.

As can be seen in Table 1, we found no empirical studies that were published before 1982. Obviously, time management has made its way into the literature without being accompanied by empirical research. The number of respondents in the studies ranged from four to 701, with an average of 90 respondents. Three types of research groups were included, i.e. (a) employees of different organizations (social service agencies, car dealerships); (b) students following a psychology course; and (c) employees with double workload, that is, working full-time while studying part-time, or working full-time and running a household with children. The majority of respondents were recruited among students in psychology classes. Research methods included self-report questionnaires, diary studies, and experiments.

Table 1. *Time Management Studies*

<i>Author</i>	<i>Method</i>	<i>Sample</i>	<i>Time management measure</i>	<i>Variables included in the study</i>
1. Adams & Jex, 1997	survey	522 employed adults	TMBS	test of factor structure of TMBS
2. Adams & Jex, 1999	survey	522 employed adults	TMBS	time management behaviors, perceived control of time, W-F conflict, job satisfaction, health
3. Bond & Feather, 1988	survey	3 samples: 312, 160 and 211 students	TSQ	time structure, self-esteem, depression, psychological distress, stat anxiety, trait anxiety, neuroticism, extraversion, health, physical symptoms, hopelessness, type A behavior
4. Barling, Kelloway & Cheung, 1996	survey	102 car salespersons	short version TMQ	short-range planning, long-range planning, achievement striving, sales performance, years of sales experience
5. Britton & Tesser, 1991	survey	90 freshman and sophomore under-graduates in psychology class	TMQ	short-range planning, long-range planning, time attitudes, grade point average, scholastic aptitude test
6. Burt & Kemp, 1994	study 1: experiment study 2: survey	study 1: 100 students study 2: 50 students	activity planning, TSQ	study 1: expected, retrospective, and actual task duration. study 2: time structure, role overload, activity duration, academic performance

Note. TMBS = Time Management Behavior Scale, TSQ = Time Structure Questionnaire, TMQ = Time Management Questionnaire.

Table 1 continued

<i>Author</i>	<i>Method</i>	<i>Sample</i>	<i>Time management measure</i>	<i>Variables included in the study</i>
7. Davis, 2000	survey	women working in 14 different nursing homes	TMBS	time management behaviors, job-induced tension, somatic tension, job satisfaction, experience, performance
8. Eilam & Aharon (2003)	intervention study, observations, and video recordings	33 students	yearly and daily planning reports	planning tasks, awareness of discrepancies between suggested versus enacted work (monitoring), and readjusting plans over time
9. Francis-Smythe & Robertson, 1999	experiment, survey	48 students or employees	TMBS, TSQ	expected task duration, retrospective and prospective tasks, time management behaviors, time structure
10. Griffiths, 2003	survey	120 central office employees or teleworkers	TMBS	time management behaviors, self-reward, self-punishment, job productivity, job satisfaction, work-family conflict, stress, positive and negative affectivity, conscientiousness
11. Hall & Hursch, 1982	diary study	4 members of faculty and staff at a university	An activity log and short survey	time spent on high-priority tasks, feelings of effectiveness, satisfaction
12. Jex & Elacqua, 1999	survey	525 employees of a variety of organizations or part-time students	TMBS	time management behaviors, role conflict, role overload, W-F conflict, strain, feelings of control over time

Note. TMBS = Time Management Behavior Scale, TSQ = Time Structure Questionnaire, TMQ = Time Management Questionnaire.

Table 1 continued

<i>Author</i>	<i>Method</i>	<i>Sample</i>	<i>Time management measure</i>	<i>Variables included in the study</i>
13. Kaufman-Scarborough & Lindquist, 1999	survey	112 participants (of which 95 workers)	TSQ	time structure, polychronicity
14. Kelly, 2003	survey	130 undergraduate students	TMBS, TSQ	time management behaviors, perceived control of time, time structure, worry
15. King, Winett & Lovett, 1986	survey, intervention	56 participants	Time Management Scale	knowledge of time management, high-priority tasks, self-monitoring of working on high-priority tasks, self-efficacy, social support, stress, life events, spouse reports
16. Koolhaas, Sijtsma & Witjas, 1992	survey	469 personnel officers	PTP'90 (Dutch scale)	optimism, saving, here and now, past, rush, vagueness, timeliness, personal growth
17. Lang, 1992	survey	96 undergraduate students	Time Management Coping Scale	time management behavior, coping, strain, somatic complaints
18. Lay & Schouwenburg, 1993	survey	65 psychology students	Short version of TMBS	trait procrastination, agitation, dejection
19. Macan, Shahani, Diphove & Philips, 1990	survey	353 employees of two organizations	TMBS	time management behaviors, perceived control of time, role ambiguity, role overload, job-induced tension, somatic tension, job satisfaction, Type A-B behavior, job performance

Note. TMBS = Time Management Behavior Scale, TSQ = Time Structure Questionnaire, TMQ = Time Management Questionnaire.

Table 1 continued

<i>Author</i>	<i>Method</i>	<i>Sample</i>	<i>Time management measure</i>	<i>Variables included in the study</i>
20. Macan, 1994	survey	study 1: 353 employees of 2 organizations study 2: 341 students	TMBS	time management behaviors, job satisfaction, job performance
21. Macan, 1996	survey, intervention study	38 employees from a social service agency	TMBS	time management behaviors, stress, job satisfaction, job performance
22. Mudrack, 1997	survey	701 adults for TSQ, 207 adults for TMBS	TMBS, TSQ	test of psychometric qualities of TSQ and TMBS
23. Orpen, 1994	diary study	96 undergraduate students	Time management scale created for the study	time management behavior, experienced overload, anxiety, depression, somatization, social desirability
24. Shahani, Weiner, Streit, 1993	survey	study 1: 93 undergraduate students study 2: 106 undergraduate students	1: TMBS, TSQ 2: TMBS	1: time management behaviors, immediate time pressure, long-term personal direction (goal), time utilization, time anxiety, time submissiveness, time possessiveness, greedy attitude towards time 2: comprehensibility of life, manageability of life, meaningfulness of life, high/low academic pressure
25. Simons & Galotti, 1992	survey, intervention study, and diary study	study 1: 88 undergraduate students study 2: 39 undergraduate psychology students	Planning Survey	planning practices, goal setting, prioritizing, accomplishment scheduling

Note. TMBS = Time Management Behavior Scale, TSQ = Time Structure Questionnaire, TMQ = Time Management Questionnaire.

Table 1 continued

<i>Author</i>	<i>Method</i>	<i>Sample</i>	<i>Time management measure</i>	<i>Variables included in the study</i>
26. Slaven & Totterdell, 1993	survey, diary study, interviews, and intervention	34 delegates of two time management training courses	Evaluation of management training, Executives Time Management Inventory	work commitment, internal work motivation, work environment factors
27. Strongman & Burt, 2000	survey, diary study	study 1: 101 first year students study 2: 17 students	study 1: TSQ study 2: diary	time structure, procrastination, role overload, self-esteem, breaks
28. Trueman & Hartley, 1996	survey	293 students	TMQ	daily planning, confidence in long-term planning, age, academic performance
29. Van Eerde, 2003	survey	37 trainees in time management workshops and 14 participants in control group	short version of TMBS	TMB, time management training, emotional stability, worrying, avoidance reactions, training motivation
30. Vodanovich & Seib, 1997	survey	115 students	TSQ	time structure, procrastination
31. Williams, Verble, Price, & Layne, 1995	survey	204 psychology students	TMQ	time management, personality types
32. Woolfolk & Woolfolk, 1986	experiment, survey, and intervention	81 beginning teachers	Evaluation time management training, self-reports about time management skills	tasks that need to be finished (with different deadlines and measurement of meeting deadlines), self-report and external ratings of use of time management

Note. TMBS = Time Management Behavior Scale, TSQ = Time Structure Questionnaire, TMQ = Time Management Questionnaire.

Definitions of Time Management

There is no agreement on the definition of time management in past studies. Although many authors referred to Lakein (1973), which suggested that time management involved the process of determinacy of needs, setting goals to achieve the needs, prioritizing and planning the tasks required to achieve these goals, several other definitions were suggested in past studies. They will be discussed below.

Time management has been referred to as techniques for managing time (Adams & Jex, 1997, 1999; Jex & Elacqua, 1999; Davis, 2000; Macan, Shahani, Dipboye, & Philips, 1990; Macan, 1994, 1996; Mudrack, 1997); a technique for effective time use, especially having enough time to accomplish the many tasks required (Orpen, 1994; Slaven & Totterdell, 1993; Woolfolk & Woolfolk, 1986); planning and allocating time (Burt & Kemp, 1994; Francis-Smythe & Robertson, 1999); the degree to which individuals perceive their use of time to be structured and purposive (Bond & Feather, 1988; Strongman & Burt, 2000; Vodanovich & Seib, 1997); a way of getting insight into time use (Koolhaas, Sijtsma, & Witjas, 1992); a technique to increase the time available to pursue activities (King et al., 1986); time management practices intended to maximize intellectual productivity (Britton & Tesser, 1991); an application of self-regulation processes in the temporal domain (Griffiths, 2003); coping behavior in at-risk populations (King et al., 1986); self-regulation strategies aimed at discussing plans, and their efficiency (Eilam & Aharon, 2003); the use of procedures that are designed to help the individual to achieve his or her desired goals (Hall & Hirsch, 1982); ways to assess the relative importance of activities through the development of a prioritization plan (Kaufman-Scarborough & Lindquist, 1999); clusters of behavior that are deemed to facilitate productivity and alleviate stress (Lay & Schouwenburg, 1993). Some authors gave no definition at all (Barling, Kelloway, & Cheung, 1996; Simons & Galotti, 1992; Trueman & Hartley, 1996).

Besides time management, other terms, such as time structure (Bond & Feather, 1988), were used interchangeably with basically the same meaning. Because a commonly accepted definition of the concept was lacking, we found it difficult to determine the exact content of time management in past research, and to describe the state of affairs, and identify which part of time management is responsible for what results.

Based on the literature, we suggest a definition of time management as behaviors that aim at achieving an efficient and effective use of time. These behaviors have three major components:

- awareness of here and now or past, present, and future (Kaufman, Lane, & Lindquist, 1991), and self-awareness of one's time use (attitudes, cognitions) (e.g., Wratcher & Jones, 1988), which help to accept tasks and responsibilities that fit within the limit of one's capabilities. We designate this component as: Time assessment behaviors.
- instructions or tools aimed at preparing to use time efficiently (setting goals, planning tasks, prioritising, making to-do lists, grouping tasks) (e.g., Britton & Tesser, 1991; Macan, 1994, 1996). We name this component: Planning behaviors.
- providing a structure for managing time and self monitoring, which allows for a feedback loop when working on tasks and limiting the interruptions by others (e.g., Fox & Dwyer, 1996; Zijlstra, Roe, Leonora, & Krediet, 1999). We name this component: Monitoring behaviors.

Research Methods Used

Research methods used in past studies mainly consisted of self-report questionnaires. There were a few diary studies and experiments. In total, ten different types of self-report questionnaires were used to measure time management behaviors, three types of which were used more often. These questionnaires are, 1) the Time Management Behavior Scale (TMBS, Macan, Shahani, Dipboye, & Philips, 1990), 2) the Time Structure Questionnaire (TSQ, Bond & Feather, 1988), and 3) the Time Management Questionnaire (TMQ, Britton & Tesser, 1991).

The TMBS was constructed by Macan et al. (1990), and was based on a list of popularized concepts of time management behaviors examined by factor analysis. The subscales were setting goals and priorities, mechanics of time management (e.g., making to-do lists), preference for organization (e.g., having a preference for an orderly way of working), and perceived control of time. Reliability scores were moderate and differed greatly among different studies (see, for instance, Davis, 2000). In her study in 1994, Macan stated that perceived control of time was actually an outcome variable of time management behaviors, and should not be considered part of the TMBS.

Adams and Jex (1997) tested the underlying factor structure of the TMBS using confirmatory factor analysis and found additional evidence for a three-factor solution, although they included 28 of the 33 original items. Shahani, Weiner, and Streit (1993) investigated the convergent validity of the TMBS (study 1) by examining the relationships

with three other scales (including TSQ). They found that the TMBS factors were significantly correlated with the other scales and concluded that the TMBS had convergent validity. They stated that the TMBS is the most elaborately validated scale to measure time management behaviors. The studies that included the TMBS did not all present the internal consistency scores (e.g., Adams & Jex, 1997). Those who did present coefficient alphas for the subscales found that they ranged from .50 to .90 (Adams & Jex, 1999; Davis, 2000; Francis-Smythe & Robertson, 1999; Macan et al., 1990; Macan, 1994; Mudrack, 1997; Shahani et al., 1993). The lowest coefficients alphas were found for the preference for organization-subscale (.50, .60, .68, .70, and .83, respectively).

The TSQ was constructed by Bond and Feather (1988) and consisted of items that referred to the extent to which time was used in a structured and purposeful way. Factor analysis on the items of the TSQ revealed six factors, but only five could be named, i.e., sense of purpose, structured routine, present orientation, effective organization, and persistence. Bond and Feather (1988) claimed that the TSQ meets the usual psychometric criteria for further use as a research instrument, and concluded that the scale had face validity. Although the internal consistency of the total TSQ score in the three samples amounted to .88, .92, and .91, respectively, the internal consistency for the subscales ranged from .55 to .75. Eight other studies included the TSQ and found internal consistencies ranging from .66 to .75.

Mudrack (1997) compared the TMBS and the TSQ psychometrically and suggested shortened version of both scales. His goal was to establish whether the factor structures of the TSQ en TMBS could be accurately replicated and whether revisions of the subscale composition were warranted. The coefficient alpha of both the TSQ and TMBS subscale scores equaled or exceeded .70, with small differences between the original and shortened form. Based upon these findings, Mudrack (1997) recommended using a 20-item version (versus 26 original items) of the TSQ and a 26-item version (versus 46 original items) of the TMBS.

The TMQ was constructed by Britton and Tesser (1991) and included items on the attitudes towards time management (e.g., 'do you feel you are in charge of your own time, by and large?') and planning the allocation of time. The scale consisted of three factors, namely short-range planning, long-range planning, and time attitudes, which together accounted for 36% of the variance. Williams, Verble, Price, and Layne (1995) included all three subscales but did not present internal consistency values or other psychometric information about the TMQ. Barling et al. (1996) used shortened forms of two subscales, short-range and long-range planning, and conducted a confirmatory factor analysis. They found that a two-factor

solution fitted their data reasonably (coefficient alpha .85 and .73, respectively). Trueman and Hartley (1996) used 14 items of the original 18-item TMQ and identified two subscales, namely daily planning and confidence in long-term planning (with coefficient alpha .85 and .71, respectively).

A common feature of the time management measures is that each includes items that refer to planning behavior. The TMBS subscale 'setting goals and priorities', the TSQ factor 'structured routine', the TMQ subscales 'short-range planning' and 'long-range planning' all refer to planning tasks and activities. Other time management measures included in this review also included planning behavior items, for instance yearly and daily planning reports (Eilam & Aharon, 2003), an activity log (Hall & Hursch, 1982), and setting goals, following priorities, scheduling, organizing and planning (Lang, 1992).

As for reliability and construct validity, the existing time management measures can be improved. So far, most support was found for the TMBS (Macan, 1994) as a psychometrically reasonably sound measure for studying time management behavior. However, it is not an ideal measure because of the variability of internal consistency values and inconsistencies in findings with respect to the relations between the subscales and outcomes measures, which will be discussed next.

Time management: the state of affairs

Not only a definition, but also a theory on time management is lacking. The question 'how does time management work and why?' is still unanswered. Only Macan (1994) presented a model of time management that comprised antecedent, mediating, and outcome variables with respect to time management behaviors. Macan (1994) stated that time management training programs lead to three types of time management behaviors: (a) setting goals and priorities; (b) mechanics of time management; and (c) preference for organization. She hypothesized that these behaviors would result in perceived control of time or the feeling of having control over one's time. Furthermore, perceived control of time was hypothesized to mediate between the time management behaviors and job-induced and somatic tension, job satisfaction, and job performance. Results showed that time management training was positively related to the time management behaviors. Setting goals and priorities and the mechanics of time management were positively related to perceived control of time, whereas preference for organization was not. Job-induced and somatic tension were negatively related, and job satisfaction was positively related to time management behavior and mediated by perceived control of time. Perceived control of time was not significantly related to job performance. These results imply that by implementing time management techniques,

one is able to experience control over what can be done within workday time. This feeling in turn has a positive effect on job satisfaction, and job-induced and somatic tensions.

Macan's (1994) model received only partial support in three replication studies (Adams & Jex, 1999; Davis, 2000; Jex & Elacqua, 1999). Jex and Elacqua (1999) found that perceived control of time partially mediated the relations between goal setting and prioritizing, and preference for organization on the one hand, and strain on the other hand. Adams and Jex (1999) found that perceived control of time mediated between setting goals and priorities, mechanics of time management, and preference for organization on the one hand, and health and job satisfaction on the other hand. Setting goals and priorities and preference for organization were positively related to perceived control, whereas mechanics of time management were negatively related to perceived control of time. Davis (2000) found that perceived control of time only acted as a mediator in the relation between preference for organization and the outcome variables job related tension, somatic tension, and job satisfaction.

In conclusion, these studies found some support for Macan's (1994) process model, where perceived control of time was hypothesized to fully mediate between time management behaviors and job- and person-related outcomes. Most of the studies included in this review focused on the relationship between time management and outcomes such as job performance and job satisfaction.

Planning tasks or activities was identified as one of the most important time management techniques, also in relation to outcome variables. Bond and Feather (1988) for instance, found that the TSQ factor 'sense of purpose' accounted for most of the variance in the total TSQ score and was therefore identified as the most important factor of the TSQ. Also, Macan (1994) found that the subscale 'goal setting and prioritizing' was significantly related to outcomes such as perceived control of time and job satisfaction. Britton & Tesser (1991) found a positive relation between short-range planning and grade point average of students, whereas long-range planning was unrelated. They stated that short-range planning was a more effective time management technique than long-range planning because plans could be adjusted to fast changes or unpredictable situations, which allowed for flexibility.

Antecedents of time management

Only a few studies investigated antecedents of time management behavior. Yet, it is quite likely that there are individual differences in the need for time management in order to perform well, to be satisfied with work, and so on, which could be considered as antecedents. Also, as is suggested by Macan's (1994) model, time management training is a likely

antecedent of time management behavior. To our knowledge, five studies focused on possible antecedents of time management. We will discuss these studies with regard to dispositional characteristics and time management training.

Dispositional characteristics. The study of Bond and Feather (1988) included many possible antecedent variables (such as neurotics and extraversion) related to time structure or time management. Due to the cross-sectional design of the study, no conclusions can be drawn about the causal direction of these relations. Bond and Feather (1988) found that time structure (total TSQ score) was positively related to sense of purpose in life, self-esteem, and type A behavior, and negatively to neuroticism and anomie (the individual's generalized sense of self-to-others alienation, Bond & Feather, 1988, p. 323).

Lay and Schouwenburg (1993) studied the relation between trait procrastination and time management and found that people high on trait procrastination exhibited a greater likelihood of being behind schedule on their personal projects, studying for an examination for fewer hours than intended, and having a low score on feeling in control of time, setting goals and priorities. They also used less time management techniques.

Shahani et al. (1993) examined the relation of time management behaviors with a theoretically related construct, i.e., sense of coherence, which is assumed to capture individual differences (coping strategies) in relation to vulnerability to stress, as well as the stability of time management behaviors under varying levels of academic stress. If time management is a personality trait, as they asserted, the reported use of time management behaviors should be unchanged under varying levels of stress. Their data provided some support for this idea.

Kaufman-Scarborough and Lindquist (1999) studied the relation between polychronic (i.e., the extent to which people prefer to perform two or more tasks simultaneously) and monochronic (i.e., the extent to which people prefer to perform one tasks at a time) time style tendency, and time management. They found that monochrons more than polychrons preferred to engage in detailed planning, although they found it hard to do so, probably because they wanted to focus on one thing at the time. Polychronic people perceived that they reached their planned goals more often than monochrons and were better able to manage work interruptions and activity switches than monochronic people.

Williams, Verble, Price, and Layne (1995) investigated the relationship between time management practices and the Myers Briggs Type Indicators (MBTI). They found that all TMQ-actors (Britton & Tesser, 1991), i.e., short-range planning, long-range planning, and time attitudes, were significantly related to the J-P (Judgment-Perception) index of the MBTI.

A high score on this scale indicates 'having a preference for a planned, orderly, and controlled way of living' (Williams et al., 1995, p. 37).

In conclusion, some support for a dispositional foundation of time management behavior was found because TSQ factors (Bond & Feather, 1988), TMQ factors (Britton & Tesser, 1991), and TMBS factors (Macan et al., 1990) appeared to be related to several personality variables, but this needs further exploration in future research.

Time management training programs. The effect of time management training programs on time management and on outcomes such as job performance was investigated in seven studies included in this review. The results with respect to the effectiveness of time management training were mixed. Four studies (King et al., 1986; Macan, 1994; Slaven & Totterdell, 1993; Van Eerde, 2003) found support, as participants indicated that they did engage in time management behavior more frequently after a time management training program; one study (Macan, 1996) did not. A positive relation between time management training and performance (e.g., time spent on working on high-priority tasks) was found in three studies (Hall & Hursch, 1982; King et al., 1986; Orpen, 1994), whereas in two other studies (Macan, 1996; Slaven & Totterdell, 1993) this relation was not found. Orpen (1994), for instance, conducted a field experiment and used a self-developed time management scale. The participants of the training group rated their time management skills higher than the control group did. A diary study showed that participants made more effective use of their time than the control group did, as rated by managers who examined their activity diaries. Macan (1996) found that participants did not report that they engaged in time management behaviors after the training program more frequently compared to a control group. Also, no direct effect of time management training on job performance, job satisfaction or stress was found. However, participants did report more feeling of control of time after they had participated in a time management program. Van Eerde (2003) found that time management training significantly increased participants' time management behaviors and decreased worrying and trait procrastination in relation to a control group.

In conclusion, past studies have demonstrated that time management training programs generally increased participants self-reported time management skills, yet an effect on job performance was only sometimes found.

Effects of time management

Time management has been studied in relation to several other outcome variables, i.e., perceived control of time (Adams & Jex, 1999; Davis, 2000; Jex & Elacqua, 1999; Francis-Smythe & Robertson, 1999; Macan, 1994), work interfering with family (Adams & Jex,

1999), sales performance (Barling et al., 1996), job performance (Davis, 2000; Macan, 1994), spending time on high-priority tasks (Hall & Hursch, 1982), college grades (Britton & Tesser, 1991; Trueman & Hartley, 1996), academic performance (Burt & Kemp, 1994), grade point average (Britton & Tesser, 1991), total study habits score (Bond & Feather, 1988), the ability to readjust plans to improve progress rate (Eilam & Aharon, 2003), accurately estimated time duration (Burt & Kemp, 1994; Francis-Smythe & Robertson, 1999), job satisfaction (Davis, 2000; Macan, 1994), role overload (Burt & Kemp, 1994), job-related and somatic tension (Davis 2000; Macan, 1994), strain (Jex & Elacqua, 1999, and health (Bond & Feather, 1988).

Results showed that time management behavior (or parts of it, such as short-range planning) was positively related to perceived control of time, sales performance, college grades, total study habits score, spending time on high-priority tasks, job satisfaction, and health, and negatively to job-induced and somatic tension, strain, psychological distress, and accurate time duration, although results were sometimes modest or inconclusive. The expected relation between time management behaviors and job performance was modest or even non-significant. Macan (1994) failed to find a positive relation with job performance, whereas Barling et al. (1996) did find a relation with sales performance, but only for those participants scoring high on achievement motivation. Jex and Elacqua (1999) only found modest effects of time management behavior on mental health of employees. Perceived control of time was found to mediate the relation between aspects of time management behavior (e.g., goal setting and priorities), job-related and somatic tension (Davis, 2000; Macan, 1994), strain (Jex & Elacqua, 1999), and job satisfaction (Davis, 2000; Macan, 1994).

Francis-Smythe and Robertson (1999) conducted an experiment in which they demonstrated that participants who perceived themselves as practicing time management behaviors did estimate the expected time durations more accurately than those who did not engage in time management behaviors but tended to underestimate time in passing. Francis-Smythe and Robertson (1999) emphasized the role of motivation in the experiment as they found that more motivated respondents had better results in planning.

In their diary study on the effects of time management behaviors, Hall and Hursch (1982) found that the time spent on high-priority tasks increased. Only four respondents were included and thus results can be questioned. In the study, they found that working on high-priority tasks was positively related to job satisfaction. The explanation given by the authors was that high-priority tasks contribute to attaining long-term goals, instead of working on urgent tasks that take valuable time and are not always the most important tasks.

Jex and Elacqua (1999) also investigated the moderating effect of time management behavior on the relation work-family conflict and strain and found support for their

hypothesis. The relation between work-family conflict and health was strongest for participants who applied time management techniques. The effects explained only a small portion of the variance and were therefore not very meaningful. Barling et al. (1996) studied the interaction of two components to measure time management behavior: i.e. short-range planning, and long-range planning, with achievement strivings to predict the job performance of car sales people. Results showed that achievement striving and short-range planning interacted to predict high job performance, whereas long-range planning did not interact with achievement striving to predict job performance. Thus, participants who engaged in short-range planning and had higher scores on achievement striving had higher job performance scores.

In conclusion, research has found positive effects of time management behavior on perceived control of time, college grades, spending time on high-priority tasks, job satisfaction, and health, and negative effects on strain and accurate time estimation, although some of the effects were rather modest. Furthermore, modest support was found for a moderating effect of time management behavior on the relation between work-family conflict and strain. Also, one aspect of time management, short-range planning, was found to interact with achievement striving in predicting job performance.

Gaps in research

Surprisingly, little research attention has been given to the question what time management can contribute in connection with organizational or work place factors. In an organization where it is not possible to plan one's workday because managers decide the order and timing of activities, or, in other words, where job autonomy is low, time management might not be an option. Time management assumes that the workplace is suitable for planning one's workday and being able to say 'no' to more work, whereas in practice, this is often not the case. Although time training programs have included this advice, the factors or conditions in the workplace or the prerequisite for time management behavior were not included in past research.

Secondly, as planning was identified to be an important aspect of time management, time management research on detailed aspects of planning such as prioritizing and planning alternative tasks in case the original plan could not be executed (for instance due to work interruptions, the unavailability of information, and so on) would have seemed logical. Also, although some authors have suggested that good planners can be poor at managing time while performing their planned work (e.g., Burt & Kemp, 1994; Eilam & Aharon, 2003), this topic has not been researched thoroughly. People might overestimate the time required to complete

a task as a safe estimation strategy. Overestimating time may be a means of controlling time and avoiding stress because they allow enough time for tasks to be completed (Burt & Kemp, 1994).

Thirdly, time management techniques aiming at completing work as planned or persisting in the execution of tasks, such as self-regulation and self-monitoring, were not the focus of previous research on time management as such. Self-regulation refers to the extent to which people are motivated and able to stick to their goal and persist into action towards the goal even when they are confronted with competing motivations (Kuhl & Fuhrmann, 1998). Self-regulation tactics (e.g., effort) have been found to be related to sales performance (Vandewalle, Brown, Cron, & Slocum, 1999) and thus may also be important with respect to time management. Also, high self-monitoring individuals have been found to show greater behavioral variability across situations and have a higher sense of what constitutes a good performance than low self-monitoring individuals (Gangestad & Snyder, 1985). Thus, for instance self-monitoring techniques aimed at individuals' use of time should be included in time management research.

A fourth point is that studies have not addressed the social context, such as the work relations among individual workers. Colleagues or co-workers, supervisors, and customers can also be responsible for a disorganized workday and not feeling in control of time (e.g., Perlow, 1999). In definitions and questionnaires of past time management studies, these factors cannot be found. Depending on the type of work, a person can be more or less interdependent of the work or information of others. Time management could include influencing or stimulating others to finish their work in time or to organize their work in a way that it supports one's own work. Also, engaging in time management behavior can be annoying for others if they do not work in a similar way. For instance, a proposed time management technique is to reserve certain office hours (e.g., between 4 and 5 p.m.) for questions of co-workers. This technique might be helpful for the individual in the reduction of interruptions at work but, at the same time, it can be inefficient for the work of others. Moreover, avoiding work interruptions, especially being interrupted by phone or email, might be an important aspect in time management research and has not been part of research yet. The relation of employees engaging in time management with others was not addressed in past research, but could be an important factor in time management research.

Fifthly, motivational aspects or self-regulation of individuals who are responsible for maintenance and effectiveness of time management techniques have not been not included in previous studies, although for instance Francis-Smythe and Robertson (1999) suggested that motivation may be important. It has been shown that motivational aspects are important

drives to energize behavior. Gollwitzer (1999), for example, stated that an action process consists of two motivational phases. In the pre-decisional phase, preferences are set by deliberating the desirability and feasibility of options. In this phase, the goal to pursue is chosen. The second, pro-actional phase involves an evaluation of the necessity of further goal pursuit. When the outcome of this evaluation is that plans are not reached, people have to motivate themselves in the persistence of goal or task pursuit. Also, Sansone and Harackiewicz (1996) stated that individuals may hold similar goals, but differ in their motivation to reach them. Motivation to reach goals has a direct effect on initial and maintenance behavior. Maintenance behavior or persistence is influenced by phenomenal experiences as 'feeling like it' and task involvement. Thus, motivational aspects could be included in future research as they are possibly important determinants of time management behaviors and behavioral change.

Conclusion & Discussion

This review of time management studies has shown that time management is not a well-defined construct. Also, the quality of measurement instruments was shown to be questionable. The effect of time management on outcomes such as job performance was not clearly established. Some studies found evidence for a positive effect on performance and job satisfaction where others failed to find such a result. Some support was found for a dispositional foundation of time management behavior, as some of the time management behaviors appeared to be related to personality variables. Time management training was demonstrated to enhance the use of time management behaviors, but there are no conclusive results about the direct effects of time management training on outcome variables.

Most of the past studies were field studies and used questionnaires. Our criticism on these questionnaires is that they were based on different definitions of time management and thus differed in their operationalization of the time management construct. Internal consistency scores of the scales differed somewhat over studies and were in some cases below the generally accepted score of .70. Planning was part of all three mostly used time management questionnaires (TMBS, TSQ, TMQ), suggesting that planning is an important time management skill.

A large number of past studies used students samples. It can be questioned whether the results for students also hold for employees, because students deal with a different kinds of work than employees, and it has not been demonstrated that the processes involved are comparable. One of the differences is that students are able to postpone activities by deciding

not to study for an exam, while employees have less possibilities to do so and face more negative outcomes of not doing certain things in time.

In conclusion, this review of time management literature demonstrates that there is still a lot of work to be done on the concept of time management. Past studies have covered only parts of the conceptual spectrum and did not always demonstrate which considerations led to their point of view on time management behaviors and to the selection of outcome variables.

In future research, time management behavior should be studied in more detail. We believe that it is necessary to explore how people plan and prioritize their work activities, whether and how they perform their planned actions, and how they implement time management techniques. To be able to do this, we firstly suggested a definition of time management behaviors that incorporates all relevant aspects. Next, a time management measure that operationalizes this definition should be constructed and a model of time management should be developed that will explain and predict outcomes of time management behaviors. Based on this research, time management training programs might be developed and evaluated. All this stands in contrast to the current situation where research has taken popular notions of time management and topics included in time management training programs as points of departure.

Future research could also focus on the characteristics of the work situation, including the lack of autonomy in work, a heavy workload, or a good planning system to organize one's time at work in relation to time management behaviors.

As for the antecedents of time management, characteristics of non-work life conditions could also influence the use of time management techniques. People with double workload, e.g., work and study, or work and a family with children, have a bigger likelihood of having to deal with priority conflicts because they have to balance between the two situations constantly. Furthermore, personality type, personal characteristics (for instance a preference for a structured work style or work strategy), and openness for learning new strategies could influence the success of time management behaviors. Individuals differ widely from one another in the degree to which they handle the passage of time and the pursuit of goals. Some individuals are constantly drawing up schedules and lists, and setting deadlines for themselves, while others pay less attention to short-term concerns (Conte, Mathieu, & Landy, 1998).

With respect to the outcomes of time management behaviors, the relation between time management behavior, perceived control of time, and effectiveness, or being able to complete tasks within the time available for task completion (deadlines), which can account

for a higher job performance (e.g., Kelly, 2002), more leisure time, or working less overtime (e.g., Rau & Triemer, 2004), could be included in future research.

Besides quantitative studies on time management, qualitative research studies could be conducted to obtain detailed information about the application of time management behaviors in practice; for instance, by means of a diary study on how people plan and prioritize their tasks from day to day, how they actually spend their workday and what considerations are important here, what unexpected events come up, and how they handle this. The advantage of a diary study is that information on time spending is obtained in time (Conway & Briner, 2002; Pentland, Harvey, Lawton, & McColl, 1999; Reis & Wheeler, 1991; Symon, 1999).

Another suggestion is to focus future research on different samples. As most studies included student samples, research on time management at work could focus on including employees in their work situations, preferably from different organizations in order to maintain variation. To be able to show the differences in decision-making and strategy between individuals, research groups could be divided into persons that are good or average time managers. Sonnentag and Schmidt-Braße (1998) have shown how this can be done. They asked supervisors to name employees that they thought had the quality to either be good or not as good at performing a certain task.

A shortcoming of the present study is that only 32 studies on time management were included in the study, which can account for a biased view of past research, although they were the only studies available within the selected criteria. Also, as there were little time management studies available and time management measures were quite different, it was not possible to do a meta-analysis on the results of previous studies.

In conclusion, this review of time management studies gives an overview of what time management can do for people. Although many people appear to be skeptical about the results of the implementation of time management in practice, scientific studies have demonstrated that the popularity of time management is justified in as far as it has an effect on control perceptions as well as on emotions and well-being at work. Results of past studies were consistent in showing evidence of positive effects of time management behavior on perceived control of time, job satisfaction, and job-induced and somatic tensions. Additionally, perceived control of time was found to positively affect outcomes such as job satisfaction and to mediate the relation between time management and several outcome variables. Therefore, perceived control of time can be considered both as an outcome of time management and as a mediator between time management and other outcome variables (e.g., job satisfaction). As for the effects of time management on job performance, results were

inconclusive. In this paper, we have introduced a new definition of time management and suggested directions for future research. We feel that time management deserves further research, using more rigorous methods of analysis. Such research may clarify both the processes involved and the effects on perceptions and performance. From a practical perspective, this time management review has identified aspects of time management that seem to affect outcomes positively. These aspects may be incorporated in current time management training programs as well as in the development of new time management interventions.

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Planning Behavior and Perceived Control of Time at Work*

This study investigated two mediation models of time management. The first model consisted of parts of Macan's (1994) model. The second model combined this model with Karasek's (1998) Job-Demand-Control model. Two sets of self-report questionnaires were collected and were analyzed using structural equation modeling. The first model, in which perceived control of time was hypothesized to fully mediate the relation between planning behavior and work strain, job satisfaction, and job performance, was found to be less adequate than the second model, which added workload and job autonomy as independent variables. Results also indicated that partial, rather than full, mediation of perceived control of time fitted the data best. The study demonstrated the importance of studying both planning behavior and job characteristics, which was not part of research yet.

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Over the last two decades, many jobs have changed as a consequence of organizational restructuring, technological innovations, and the introduction of new management principles. Professional and managerial jobs have generally witnessed an increase in job scope and autonomy, accompanied by a greater emphasis on speed and timeliness (e.g., Garhammer, 2002). The incumbents of these jobs are typically given substantial discretion in order to effectively deal with complex tasks and tight deadlines (e.g., Tripoli, 1998). Several studies have pointed out the rise in work intensity and time pressure over the last decades as a consequence of these changes (e.g., Endler, Marcrodimitris & Kocovski, 2000; de Jonge, 1996; Karasek, 1998). In this context, self-management, especially regarding the temporal dimension of work, has become a critical issue. This is exemplified by the increased demand for time management training in managerial practice, observed by Macan (1994, 1996).

Although providers of time management training tend to claim substantial time saving and augmented performance, there is, as yet, little empirical evidence to substantiate these claims. A study by Macan (1994) found a weak relationship between participation in time management training and one facet of time management behavior, i.e., “setting goals and priorities”, also referred to as planning behavior.

Planning behavior can be conceived as part of people’s work strategy. A work strategy has been defined as an “approach to planning and allocating effort across goals, activities, and time periods” (Tripoli, 1998, p. 456). In our definition, the term “planning behavior” refers to decisions about which tasks to perform, how these tasks should be prioritized, and how to deal with possible distractions, especially when one has to perform several tasks simultaneously. Several studies have been devoted to the effects of planning behavior. Macan (1994) found that planning behavior as such – irrespective of the impact of time management training – had a significant relationship with “perceived control of time”, which in turn was positively related to job satisfaction and negatively to job-induced and somatic tensions. Perceived control of time thus acted as a mediator in the relationship between planning behavior and these variables. In other studies of planning behavior – usually operationalized as setting goals and priorities – positive relationships were found with self-reported job performance (Davis, 2000; Macan, Shahani, Dipboye, & Philips, 1990); grade point average (Macan et al., 1990); perceived control of time (Adams & Jex, 1999; Jex & Elacqua, 1999; Macan, 1994); job satisfaction (Adams & Jex, 1999; Davis, 2000; Macan et al., 1990; Macan, 1994); and health (Adams & Jex, 1999). Furthermore, it was found that planning behavior was negatively related to strain (Jex & Elacqua, 1999); somatic tension (Davis, 2000); and role ambiguity (Macan et al., 1990).

Studies on so-called “short range planning behavior”, i.e., planning in the short run, within the time frame of a week or less, demonstrated a positive relationship to grade point average (Britton & Tesser, 1991). Also, short range planning in interaction with achievement striving was positively related to sales performance (Barling, Kelloway, and Cheung, 1996).

In summary, it appears that planning behavior relates positively to the feeling of being in control of one’s time, productivity, job satisfaction, and health, whereas it relates negatively to feelings of strain.

An important limitation of the research carried out thus far is that all studies (except Macan’s 1996 study) have used cross-sectional designs, which makes it impossible to draw conclusions about the direction of these effects. Reversed causation may occur as well (Taris, 2000). Therefore, research with multiple waves is needed to establish the direction of the effects.

The present study is meant to represent a further step in the research on planning behavior by checking earlier findings in a design in which data are gathered in two waves. The point of departure is part of Macan’s (1994) model, in which perceived control of time fully mediates the relationship between planning behavior on the one hand, and individual strain, performance, and satisfaction on the other hand. We will examine the validity of this part of the model and extend it by incorporating two variables derived from Karasek’s work on occupational stress (1998), i.e., workload and job autonomy, which are likely to have an influence on perceived control of time and outcome variables as well.

Planning Behavior and Perceived Control of Time

Planning behavior can be considered a particular way of goal setting. Goal setting theory assumes that human action is directed by conscious goals and intentions. However, goals do not have to be in one’s conscious awareness all the time during goal-directed action in order for them to regulate action. People make plans to reach sub-goals and focus on them, rather than on the end goal. Continuously focusing on the end goal would distract an individual from taking the actions needed to reach it (Locke & Latham, 1990). While we prefer to speak of planning behavior, others have used the terms goal setting and prioritizing (Macan, Shahani, Dipboye, & Philips, 1990), and short-range planning (Britton & Tesser, 1991), which are roughly equivalent in meaning.

The notion of perceived control of time was introduced by Macan et al. (1990). In the process model of time management, which Macan proposed in 1994, three dimensions of time-management behavior were distinguished, i.e., setting goals and priorities, mechanics of time management (e.g., making notes and lists), and preference for organization (i.e.,

working in a systematic fashion). The effects of these behavioral dimensions on outcomes were supposed to be fully mediated by perceived control of time. Macan (1994) derived this supposition from the goal-setting literature. In a sample of 353 part-time students who were also employees of two organizations, Macan indeed found that perceived control of time did mediate between setting goals and priorities on the one hand and job satisfaction, job induced tensions, and somatic tensions on the other hand. The mediation effect was not found for performance, however. In a replication study of Macan (1994), carried out in a sample of 525 employees of a variety of organizations who were also part-time students, Jex and Elacqua (1999) found that perceived control of time partially mediated the relations between goal setting and prioritizing, preference for organization on the one hand, and strain on the other hand. In another replication study, involving 522 working adults who were enrolled as part-time students, Adams and Jex (1999) found that perceived control of time mediated between setting goals and priorities, mechanics of time management, and preference for organization on the one hand, and health and job satisfaction on the other hand. Setting goals and priorities and preference for organization were positively related to perceived control, whereas mechanics of time management were negatively related to perceived control of time. Davis (2000) also conducted a replication study of Macan's (1994) model. In a sample of 54 certified nursing assistants, he found that perceived control of time only acted as a mediator of the relationship between preference for organization and the outcome variables job related tension, somatic tension, and job satisfaction.

In summary, limited support was found for a mediation effect of perceived control of time, especially with respect to the effects of setting goals and priorities, or planning behavior, and preference for organization (Adams & Jex, 1999; Davis, 2000; Jex & Elacqua, 1999). Yet, the evidence is not conclusive and needs further investigation. Moreover, one may argue that time management behavior, and in particular planning behavior can directly influence performance and job strain, because it may lead to a better temporal fit between personal resources and work demands. Planning may simply help a person to distribute attention and energy more effectively, and thereby help to avoid or reduce delays and overload. Thus, a direct relationship of planning behavior with performance and work strain may exist, in addition to an indirect one, via perceived control of time.

Job Characteristics and Perceived Control of Time

Although perceived control of time is likely to depend on the planning activities of the individual, characteristics of the work setting may play a role as well. In addition, they may directly impinge on the outcome variables. Following Karasek's (1998) Job Demand-Control

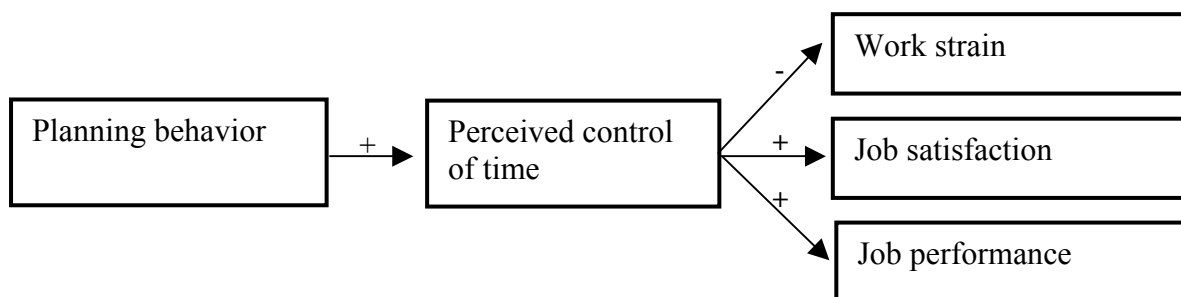
model one would expect that a person's workload and job autonomy would affect perceived control of time as well as experienced work strain. It seems reasonable to assume that job demands and job control will add to the effects of planning behavior, both on perceived control of time and on the outcome variables.

Job demands can be defined as the psychological stressors that stem from the work environment or work load (Karasek & Theorell, 1990). In this article, we conceive job demands as workload. Job control can be defined as the extent to which the job provides freedom, independence, and discretion to the employee in scheduling the work and in determining the procedures to be used to carry it out (Karasek & Theorell, 1990). In the following, we will refer to job control as job autonomy. Both workload and job autonomy are supposed to influence the development of stress (e.g., de Jonge, 1996). The combination of high workload and low job autonomy may produce more stress complaints, the "strain hypothesis". In contrast, jobs combining high demands and high control are expected to result in active learning behavior, the "activation hypothesis". The activation hypothesis states that the combination of high workload and high job autonomy may result in an increase of intrinsic job motivation, learning, and personal growth (Karasek & Theorell, 1990; Theorell, 2000). Research on occupational stress has provided modest support for the Job Demand-Control model with respect to the strain hypothesis, the interaction between workload and job autonomy (e.g., de Lange, Kompier, de Jonge, Taris, & Houtman, 2001; de Jonge & Kompier, 1997; Dwyer & Gangster, 1991; Terry & Jimmieson, 1999). However, most studies have found additive rather than interactive effects of these variables, i.e., high workload and low job autonomy had a significant main effect in relation to stress complaints (e.g., Barnett & Brennan, 1997; Parkes, Mendham, & Von Rabenau, 1994). With respect to the activation hypothesis, the results on the association between job characteristics and psychological well-being were inconclusive (Van der Doef and Maes (1999) in: de Lange, Kompier, de Jonge, Taris, & Houtman, 2001). Following past studies on the strain hypothesis, we consider workload and job autonomy as having an additional, rather than interactive effect on outcomes such as work strain. Furthermore, in investigating the activation hypothesis, we focus on job satisfaction as a positive outcome of job characteristics. Here we also consider workload and job autonomy as having an additional effect, rather than an interactive effect. The relation between job conditions and job satisfaction has been established before (e.g., Dormann & Zapf, 2001).

Models and Hypotheses

In this study we examine two models of planning behavior and its effects over time. The first model, a reduced version of Macan's (1994) model is depicted in Figure 1.

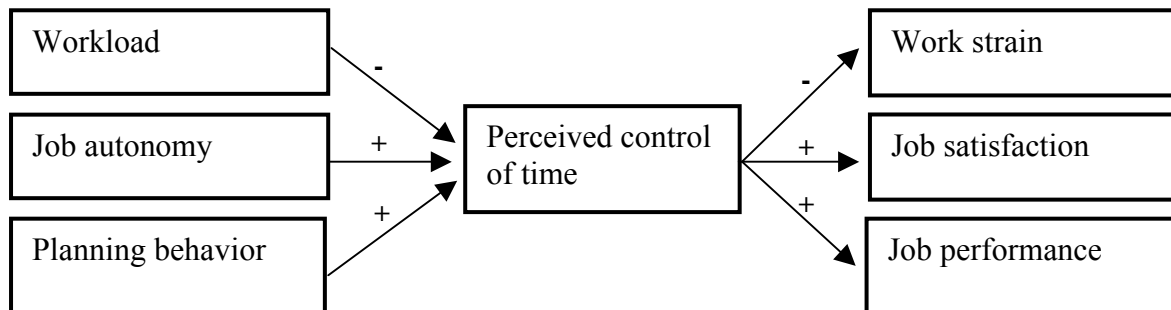
Figure 1. Reduced version of Macan's (1994) full mediation model: the effects of planning behavior (Time 1) on outcome variables (Time 2), mediated by perceived control of time (Time 2).



The model predicts that planning behavior will lead to higher perceived control of time, and that perceived control of time will lead to less work strain, more job satisfaction, and higher job performance. Thus, in accordance with the view of Macan (1994), perceived control of time is supposed to fully mediate the effects of planning behavior on the outcome variables. As we have pointed out before, the assumption of a full mediation effect may be too rigorous. We therefore expect that partial mediation improves the fit of the model, when testing direct links between planning behavior, work strain, job satisfaction, and job performance.

The second model is a modification of the first one. The two work characteristics that were discussed above have been added, i.e., workload and job autonomy. Like Macan's (1994) model, it assumes a full mediation effect of perceived control of time. The second model is depicted in Figure 2. We expect the fit of the model to increase when partial mediation effects are tested, i.e., when direct links are added from planning behavior, workload, and job autonomy to work strain, job satisfaction, and job performance.

Figure 2. Extended full mediation model: the effect of planning behavior (Time 1) and job characteristics (Time 1) on outcome variables (Time 2), mediated by perceived control of time (Time 2).



In summary, we propose the following hypotheses:

1a The model in Figure 1, describing a full mediation of the effects of planning behavior on work strain, job satisfaction, and job performance, produces an adequate fit.

1b Alternative hypothesis: The fit of the model will improve when mediation is considered to be partial rather than full, that is when planning behavior is allowed to have direct effects on outcome variables.

2a The model in Figure 2, describing a full mediation of the effects of planning behavior, work load, and job autonomy on work strain, job satisfaction, and job performance, produces a better fit than the model in Figure 1.

2b Alternative hypothesis: The fit of the model will improve when mediation is considered to be partial rather than full, that is when planning behavior, work load, and job autonomy are allowed to also have direct effects on outcome variables.

Method

Sample and Procedure

The location for this research was the Corporate Headquarters of an international company among world leaders in the manufacturing of advanced technology systems for the semiconductor industry, with more than 50 company sites in 16 countries around the world. The company designs, develops, integrates, markets, and services advanced systems used by major global semiconductor manufacturers to create chips that power a wide array of electronic, communications, and information technology products.

R&D engineers, the participants in this study, worked in one of the major departments of this company in the Netherlands. They were highly educated and were expected to constantly improve earlier performances. Autonomy and initiative were, as the company believed, the only way to continue to develop groundbreaking products. Employees who wanted to succeed had to show a great deal of initiative and had to provide a substantial degree of individual input. The engineers did not only have to deal with high workload and high work pace, but they were also given a large degree of autonomy and flexibility in the execution of their tasks.

One hundred and twenty-four engineers of two Research and Development departments were recruited to participate in a survey study on how people manage their own work. The departments consisted of a total of 193 engineers and only those who were permanently employed in R&D were selected for this study.

Ninety-nine engineers returned the first questionnaire and 79 engineers returned the second questionnaire. Nine participants did not return the first survey but did return the second questionnaire, either because they were on holiday at the time of the first survey or simply forgot to return the first questionnaire. Hence, the effective sample size varied from Time 1 to Time 2. Overall, 70 engineers (a 56% response rate) returned two usable questionnaires. Respondents were mainly male (80%), with an average age of 33 years. On average, they had worked four years within the company, and two years in their current job. While the engineers worked on average 8.5 hours a day, 26 of them indicated they also worked during weekends, on average 2.3 hours per weekend. Twelve of them had participated in a time-management training program, 3 to 5 years before this study.

The data were collected in two waves with an interval of three months. R&D projects had a duration of between three months and several years. We choose a time lag of three months to avoid any influence due to work in different projects during data gathering.

In the original process model (Macan, 1994), perceived control of time mediated between the three time management behaviors and outcome variables concurrently. This would imply that, for instance, planning behavior had an immediate effect on perceived control of time, which in turn immediately effects job performance, job satisfaction, or other outcome variables. In our view, time plays a role, and we consider it unlikely that planning behavior will immediately affect perceived control of time. Instead, we argue for a postponed effect of planning behavior on perceived control of time. Making to-do lists and prioritizing increases the insight into tasks that need to be performed, but only after a while this will lead to the idea that they are under control. So, in the long run, planning enables one to get an overview on the tasks that need to be performed, deadlines, and priorities, which increases

the perceived control of time. The immediately measurable effect of planning may even be that it leads to less perceived control of time because it may be confronting to know how much work needs to be done within hours, days, or weeks. However, when control of time is perceived, we expect an immediately measurable effect of perceived control of time on outcome variables such as job performance and job satisfaction.

All measures were self-administered; the instruction for completion was given on the first page of the questionnaire. To avoid calling attention to time management issues, we included information on the cover page informing respondents that the survey examined opinions about work and personal factors that influence the execution of one's work. All respondents voluntarily completed the two questionnaires and were given company time to respond. The first questionnaire measured planning behavior, experienced workload, and job autonomy. The second questionnaire, which was administered three months after the first, covered perceived control of time, job performance, job satisfaction, and work strain. The importance of complete, accurate responses was stressed, and the confidentiality of the responses was assured. Participants were offered a summary of their personal and group results in exchange for their participation.

Measures

The following scales were covered in the two questionnaires.

Planning behavior was measured with an eight-item scale derived from the subscale "Setting goals and priorities" of the Time Management Behavior Scale (Macan, Shahani, Dipboye & Philips, 1990). Based on a previous study, long-term goal-setting items were excluded from the scale (Peeters & Rutte, 2004). The remaining items referred to planning behavior as we defined it; short-term planning and prioritizing tasks. One item of the TMBS was replaced with a planning behavior item of the Time Management Questionnaire (Britton & Tesser, 1991). Examples of items included are: "I set myself short-term goals" and "I plan my daily work activities". Responses were made on a 5-point scale ranging from 'do not agree at all'(1) to 'completely agree'(5).

Perceived workload was defined as the subjective experience of objective task workload (Van Veldhoven, Meijman, Broersen, & Fortuin, 1997), and was assessed with an 11-item scale indicating whether a person feels that there is much work to do and whether the work pace is high. Responses were made using 4-point scales from 'never' (0) to 'always' (3). Example item: "Do you need to work fast to finish your work?"

Job autonomy, defined as the degree to which the job provides freedom, independence, and discretion to the employee in scheduling the work and in determining the

procedures to be used for carrying it out (Van Veldhoven, Meijman, Broersen, & Fortuin, 1997), was assessed with an 11-item scale, to measure the extent to which a person experiences autonomy on the job. Responses were given on the same 4-point scale used for assessing perceived workload. Example item: “Are you free in executing your work the way you want it?”. The perceived workload and job autonomy scales have been validated and are widely used instruments in the Netherlands (Van Veldhoven, de Jonge, Broersen, Kompier, & Meijman, 2002).

Perceived control of time. Six items were used to assess the extent to which individuals believe they can directly affect the way they manage their time. As a pilot study revealed that the Dutch translation¹ of Macan’s original scale produced an unreliable scale, we used two out of five original items, and added four new items. Ratings were made on a 5-point scale ranging from ‘do not agree at all’ (1) to ‘completely agree’ (5). Factor analysis showed that one item of Macan’s scale, “In my work, performing well or not mainly depends on luck”, clearly loaded on another factor and was therefore deleted from the scale. The remaining items were: “I feel in control of my time”, “I find it difficult to keep to my schedule because others take me away from my work”, “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”. The explained variance (of the remaining five items) was 41,87%.

Job performance was measured by asking respondents to rate their performance relative to their colleagues (Roe, Zinovieva, Dienes, & Ten Horn, 2000). Eight statements, for example “It has been acknowledged that my performance is higher compared to my colleagues” could be rated ‘yes, that is true’ (1) to ‘no, not true’ (5). The items were reversely scored so that a higher score indicated a higher job performance. One item was deleted, based on low intercorrelations.

Job satisfaction was measured with the Kunin (1998) faces measure, with five different faces to choose from, ranging from a very happy to a very unhappy face. A high score indicated more job satisfaction.

Work strain was assessed with a 12-item scale (Roe & Zijlstra, 2000) and indicated people’s dealing with strain in their job caused by time pressure. Participants responded to each item using a 5-point scale ranging from ‘do not agree at all’ (1) to ‘completely agree’(5). Example item: “I find it hard to relax at the end of a workday”.

¹ The items were translated in Dutch and were translated back to the original language by sworn translators.

Results

Data Analysis

Descriptive statistics, coefficient alphas, and intercorrelations were inspected. The independent variables were measured at Time 1, the mediating and dependent variables were measured at Time 2. We expected a postponed effect of the independent variables on the mediating variable and an immediate effect of the mediating variable on the dependent variables.

First, a full mediation model based on Macan's (1994) model was tested with variables measured over time. Secondly, the same mediation model was tested when allowing partial mediation. Direct effects of planning behavior on work strain, job satisfaction, and performance were tested. Thirdly, an extended full mediation model based on Macan's (1994) model was tested. The model was extended by the inclusion of workload and job autonomy as independent variables. Fourthly, the extended model was tested when allowing partial mediation, i.e. when direct effects of planning behavior, workload, and job autonomy on work strain, job satisfaction, and job performance were added.

We tested the models using structural equation modeling according to LISREL 8.50 (Jöresborg and Sörbom, 2001). A common method to demonstrate mediation is through multiple regression analysis (Baron & Kenny, 1986), but structural equation modeling allows for testing the whole model at once with the advantage of including all the variables simultaneously and accounting for all other effects of the variables. This method also reduces the chance of type I error.

We followed the suggestion of Dormann and Zapf (2002), and used all available information and accounted for missing data using the EM algorithm (expected maximalization). The EM algorithm is a general method of finding the maximum-likelihood estimate of the parameters of an underlying distribution from a given data set when the set is incomplete or has missing data due to problems with or limitations of the observation process (Dempster, Laird, and Rubin, 1977). This technique has been shown to be superior to other missing data strategies such as mean substitution, single regression imputation, pairwise deletion, or listwise deletion (Dormann & Zapf, 2002).

Our sample consisted of 99 respondents at Time 1 and 79 respondents (of which 9 did not return the Time 1 questionnaire) at Time 2. The EM algorithm was used to replace missing data for the first sample ($n = 29$) at Time 2 and to estimate Time-1 results for the second sample ($n = 9$). Through the application of the EM algorithm, the sample on which the structural equation models were tested consisted of 108 respondents.

To test the extent to which the model fitted the data, the root mean square error of approximation (RMSEA, Brown & Cudeck, 1993), the comparative fit index (CFI, Bentler, 1990), and the goodness-of-fit index (GFI, Jöreskog & Sörbom, 2001) were inspected. Browne and Cudeck (1993) maintained that RMSEA-values below .05 show a good fit, and values between .05 and .08 are acceptable. It is customary to regard CFI values higher than .90 as indicative for a good fit (Bentler, 1989), although others recently argued that only CFI values of .95 and over can be considered to indicate a good fit (Hu & Bentler, 1999). Modification indices were used to determine whether unspecified paths should be added².

Descriptive Statistics

Descriptive statistics, coefficient alphas, and intercorrelations among planning behavior, job characteristics, and outcome variables at Time 1 and Time 2 are presented in Table 1. All reliability estimates (coefficient α s) were above .70.

Table 1. Descriptive Statistics and Intercorrelations among all Study Variables

Variable	Range	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
<i>Time 1</i> 1. Planning behavior	1-5	3.38	.48	(.72)						
2. Workload	0-3	1.35	.32	.10	(.84)					
3. Job Autonomy	0-3	2.09	.34	.22*	-.01	(.74)				
<i>Time 2</i> 4. Perceived control	1-5	3.66	.60	.25*	-.20	.29*	(.73)			
5. Job performance	1-5	3.73	.48	.33**	.09	.09	.18	(.76)		
6. Job satisfaction	1-5	4.08	.67	.30**	.16	.13	.17	.12	-	
7. Work strain	1-5	2.35	.55	-.07	.27*	-.31**	-.58**	-.14	-.16	(.85)

Note. Time 1 $n = 99$, Time 1,2 $n = 70$. Figures in parentheses are alpha reliabilities.

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

² We acknowledge Harry Garst for his statistical advice.

Mediation Model of Planning Behavior

We hypothesized (1a) that a full mediation of the effects of planning behavior on work strain, job satisfaction and job performance produces an adequate fit. Results showed that the full mediation model did not fit the data ($\chi^2 = 17.32$, $df = 3$, $p < 0.01$, $RMSEA = .211$, $CFI = .68$, $GFI = .94$).

Our alternative hypothesis (1b) was that the fit of the model would improve when mediation was considered to be partial rather than full, that is, when planning behavior also had direct effects on outcome variables. The results showed that when partial mediation was allowed, i.e., when direct effects of planning behavior on work strain and on job performance were added, the fit improved ($\chi^2 = 6.76$, $df = 1$, $p < 0.01$, $RMSEA = .232$, $CFI = .88$, $GFI = .98$) but was not yet acceptable.

Extended Mediation Model of Planning Behavior

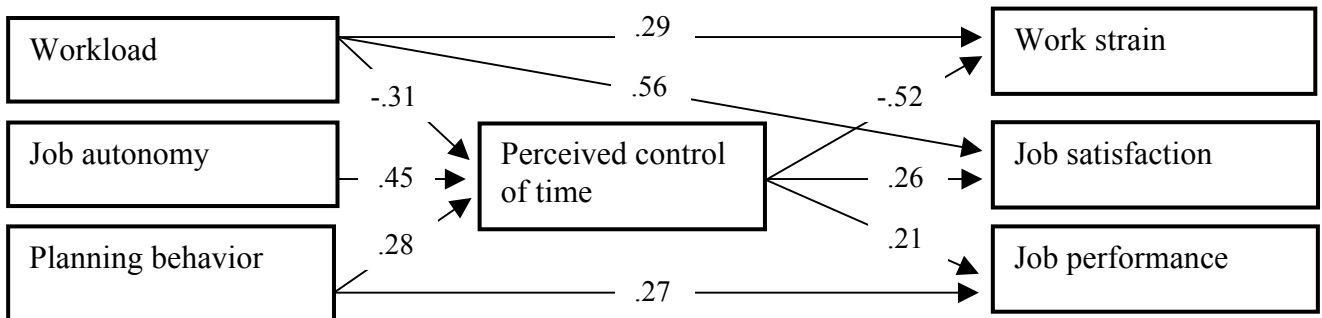
As an extension of the first model, we included perceived workload and job autonomy as independent variables. The extended model consisted of planning behavior, work load, job autonomy, perceived control of time, and work strain, job satisfaction, and job performance.

First, we hypothesized (2a) that the extended full mediation model produced a better fit than the full mediation model derived from Macan (1994). Results showed that the fit measures of this full mediation model were slightly better than the original full mediation model (1a), but not convincingly ($\chi^2 = 42.67$, $df = 14$, $p < 0.01$, $RMSEA = .138$, $CFI = .74$, $GFI = .90$).

Secondly, our alternative hypothesis (2b) was that when partial mediation was allowed, the model's fit would improve. The best-fitting model³ was a partial mediation model with direct effects of planning behavior on job performance, workload on work strain, and of workload on job satisfaction. This model, which is depicted in Figure 3, appeared to have an acceptable fit ($\chi^2 = 17.42$, $df = 11$, $p < 0.01$, $RMSEA = .07$, $CFI = .94$, $GFI = .96$).

³ The results from the mediation analysis (N = 70) following Baron & Kenny (1986) were the same as those using the SEM analysis. Only two paths were different: the path from workload to job satisfaction (N = 108) was not found in the regression analysis (N = 70). Instead we found a path from planning behavior to job satisfaction.

Figure 3. Observed mediation model: the effect of planning behavior (Time 1) and job characteristics (Time 1) on outcome variables (Time 2), mediated by perceived control of time (Time 2) with partial mediation effects.



Conclusion and Discussion

The purpose of this study was firstly to examine a mediation model based on a process model (Macan, 1994) in which perceived control of time fully mediated between planning behavior and outcome variables over time (Hypothesis 1a), and secondly, to test an extended mediation model in which perceived control of time fully mediated between job characteristics, planning behavior, and outcome variables over time (Hypothesis 2a). We expected both models to be improved by adding partial mediation (Hypotheses 1b and 2b).

We were not able to find evidence for a full mediation model as suggested by Macan (1994), so Hypothesis 1a was rejected. Full mediation would imply that planning daily activities and prioritizing them enhances perceived control of time, leading to less strain, more job satisfaction, and higher job performance. This means that by planning activities, a cognitive process (perceived control of time) is triggered, which leads to the positive outcomes. However, planning behavior can also affect outcomes directly, because it enables people to structure their activities and schedule them in accordance with available resources and opportunities, which increases the likelihood of completing work as planned and therefore feeling less strained due to work. Allowing partial mediation in this model (Hypothesis 1b) improved the model's fit, but the result was still not satisfying.

The extended full mediation model, which included job characteristics (Hypothesis 2a), did not significantly fit the data, but when partial mediation was allowed, the fit greatly improved, confirming Hypothesis 2b. The partial mediation model that best fitted the data allowed direct relations between planning behavior and job performance, between workload and work strain, and between workload and job satisfaction. Planning behavior and job autonomy positively affected perceived control of time, whereas workload had a negative

effect on perceived control of time. Perceived control of time, in turn, was positively related to job performance and job satisfaction, and negatively to work strain. This suggests that autonomy only has an indirect effect on the outcomes, which means that people with high autonomy experience perceived control of time and therefore feel less strained, more productive, and more satisfied in their work.

There is a partial mediation for work load as well as planning behavior, which means (1) a higher work load leads to less perceived control of time, feeling more strained, less satisfied, and less productive, and (2) planning behavior leads to more control and therefore less strain, more satisfaction, and feeling more productive than others.

Summarizing the above, it was shown that a reduced version of Macan's (1994) model, in which planning behavior was not directly related to outcome variables, but only indirectly through perceived control of time, did not fit our data. Jex and Elacqua (1999), and Davis (2000) were also unable to replicate the full mediation effect, and our study, with data gathered in two waves, once more confirmed their findings. Our findings are also in line with studies of Britton and Tesser (1991); Davis (2000); and Macan et al. (1990) that showed a direct relation between planning behavior and self-reported performance in cross-sectional studies.

The finding that work load had a direct and positive effect on work strain is consistent with past studies (e.g., Karasek, 1998). Workload was also directly and positively related to job satisfaction. This suggests that people do not always experience negative consequences of a heavy workload. Perhaps this is because their work is also perceived as challenging or gives a greater sense of accomplishment upon completion. A positive relation between work load and job satisfaction was also found in a study on general practitioners (GP), who were able to influence the demand-led part of workload themselves (Groenewegen & Hutten, 1991). In other words, when GPs feel that they can manage their workload to some extent, they are more satisfied with their work even though the workload is high. The same may apply to the R&D engineers in our sample. This idea corresponds to the activation hypothesis of the Job Demand-Control Model, where a combination of high workload and high job autonomy is related to intrinsic job motivation, learning, and personal growth (Karasek & Theorell, 1990; Theorell, 2000). Future studies should take this possibility into account. Most studies only address the strain hypothesis.

We have shown that perceived control of time is an important variable when studying the effects of planning behavior on the one hand, and the effects of job characteristics on the other hand. As for the Job Demand-Control Model, we have found reasons to suggest that perceived control of time should be included as a mediating variable between job demands

and job control, and work strain. Low perceived control of time might be the reason people feel strained due to high workload and/or low job autonomy. This idea deserves further examination in future studies on the Job Demand-Control Model.

Concluding, our study stresses the importance of studying job characteristics besides planning behavior, something which previous studies on time management have not addressed. The combination of insights from the Job Demand Control model and time management perspectives leads to a more adequate view on possible processes involved in work strain, job satisfaction, and performance in highly autonomous jobs.

One limitation of this study is the use of single-source data, which may have introduced a certain degree of method bias. On the other hand, in contrast with most other studies, we have used a design in which data were gathered in two waves, which reduces this bias somewhat because data were collected at least at different moments in time, making reversed causation less likely. The data were collected with an interval of three months. The length of the time lag that is needed for the causal variable to influence the effect variable is in general still a point of discussion, since there is little information available (Taris & Kompier, 2003) and the recommendations concerning the length of this time lag tend to be inconsistent (de Lange, Taris, Kompier, & Houtman, 2003). The amount of time between waves can be anything from several weeks to more than several decades (pp 1, Taris, 2000). We gathered data with a time lag of three months based on the minimum duration of R&D projects, and although this time lag may not be ideal, at least some time had passed, which reduced the common method bias. Perhaps, longer time lags might account for stronger effects.

Another limitation of this study concerns its external validity. The variance of the engineers' scores on workload and job autonomy is quite low. The engineers in this study worked in highly pre-structured and pre-organized jobs, and perhaps in less organized jobs, planning may be more strongly related to perceived control of time than in this case. In a more heterogeneous group, we expect to find even stronger relations than in this particular study.

A third limitation of this study is the use of self-reports, especially when assessing job performance. People tend to overestimate their job performance and there may be common source bias with the independent variables. A study including multiple sources of job performance ratings would have been preferable. As a study on the psychometric properties of multi-source performance ratings demonstrated, there was a relatively low correlation (.35) for the agreement between supervisor and self-ratings and also (.36) between peer and self-ratings (Conway & Huffcutt, 1997).

Future studies should replicate our study to confirm the positive effects of planning behavior on perceived control of time, as well as on job performance, job satisfaction, and work strain. Also, replicating our study in other samples than R&D engineers might be interesting. Furthermore, it would be worthwhile to extend the longitudinal study of planning behavior to its relationship with other outcome variables, particularly effectiveness. Effectiveness not only refers to general job performance, but also to dimensions such as the efficiency, time, and quality of work. Effectiveness becomes increasingly important, as people need to improve their work processes continuously and use their time efficiently and effectively. It would be interesting to include effectiveness as judged by others than themselves (e.g., co-workers and supervisors).

It would certainly be worthwhile to employ different time intervals in future studies. That is, when all variables in the model are measured repeatedly so that the causal relation between variables can be studied. Thus, more information on the suggested postponed effect of perceived control of time can be obtained. Also, measuring the dependent variables at Time 1, the mediating at Time 2, and the outcome variables at Time 3 might lead to better view of the dynamic relationships of the variables.

Finally, future research in this area might also be enriched by applying various research measures, such as daily diaries or experimental methods to study planning behavior and allocation of time. Daily diaries, for instance, could be used to study the actual differences between planned and obtained outcomes of work and the relation with daily work satisfaction. In an experiment, the results of a planning behavior intervention can be studied to see whether or not this leads to perceived control of time.

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Planning, Prioritizing, and Executing Daily Work Tasks^{*}

This study focused on the much observed discrepancy between work plans and actions of individuals in organizations. A diary study was conducted in order to investigate the planning, prioritizing and completion of planned tasks in detail. Besides task dimensions, personal and job characteristics were studied. Results showed that highly urgent and important tasks were given highest priority ratings. However, people indicated that they performed the highly urgent yet unimportant tasks to a greater extent than other tasks. Multilevel results demonstrated a significant positive effect of time management training, conscientiousness, and emotional stability on the completion of daily planned tasks. Additionally, interviews results demonstrated individual differences in planning and executing daily work tasks.

^{*} This chapter was based on: Claessens, B.J.C., van Eerde, W., Rutte, C.G., & Roe, R.A. Planning, prioritizing, and executing daily work tasks. Manuscript in preparation

In modern organizations, it is common for employees, especially those working in autonomous jobs, to receive general task goals which they need to translate into personal goals. In order to achieve these personal goals, it has been suggested that planning behavior is necessary (Frese, Stewart & Hannover, 1987). Planning behavior can be considered a particular way of goal setting and involves a complex set of mental and behavioral operations that bring together cognitive, emotional, and motivational resources in the service of reaching desired goals (Friedman & Scholnick, 1997). It refers to decisions about which tasks to perform, how these tasks should be prioritized, and how to deal with possible distractions, especially when one has to perform several tasks simultaneously (Claessens, van Eerde, Rutte, & Roe, in press).

Research on planning has addressed various aspects of planning, such as people's estimations of task duration times (Burt & Kemp, 1994) or more specifically, the tendency to underestimate the time to complete tasks ('planning fallacy', Koole & van 't Spijker, 2000; Newby-Clark, Ross, Buehler, Hoehler, & Griffing, 2000), systems that support the planning of multiple tasks (Hill, Long, Smith, & Whitefield, 1995), or the positive effects of planning on organizational performance (Smith, Locke, & Barry, 1990). Much of this research has studied the 'cognitive processes that enable mature individuals to plan' (Friedman & Scholnick, 1997), but work tasks that are actually executed has hardly been addressed. Yet, a much-observed phenomenon in organizational settings is that there is a discrepancy between individual work plans and actions, and as a consequence between planned and obtained outcomes. Most workers recognize the following: tasks that they had set for themselves at the beginning of their workday (as so-called 'to-do-list') are still on their list at the end the workday and even more tasks were added. In other words, they are often unable to complete their work as planned.

One of the factors that can explain why planned work tasks are not completed is that people do not act on their intentions as they would have liked to. Why do people have good intentions but don't act upon them? Gollwitzer (1999) and others (e.g., Koch and Kleinman, 2002) observed that people have problems in getting started and in persisting in behavior until their goal is reached. Successful goal pursuit depends on self-regulatory skills to initiate, and/or to persist in the behavior required to reach a goal. Self regulatory skills can be defined as monitoring ongoing behavior aimed at evaluating whether the current behavior is in line with the previously set norm or goal, and implementing compensatory behavior when needed (Carver & Scheier, 1998). It also involves monitoring the environment that facilitates or hinders goal attainment, and identifying and administering rewards for working

toward, and penalties for failing to work toward, goal attainment (Latham & Locke, 1991). These skills may also include being able to avoid or deal successfully with distractions, especially when one has to perform several tasks simultaneously. These distractions may be extrinsic, for instance interruptions by colleagues, or intrinsic, for instance thoughts about perfect behavior, lack of self discipline, and lack of self regulation (Zijlstra, Roe, Leonora & Krediet, 1999).

In this study, we aimed to investigate the planning process in a work setting in order to gain insight into the factors that play a role in the (non)-completion of planned work tasks. We focused on personal and job factors related to self-management, to the exclusion of factors such as leadership or organizational factors.

To our knowledge, there has been little research on how people decide which tasks to perform and which tasks to complete during their workdays. Time management has been introduced as a self management tool to teach people how to plan tasks and activities for themselves and to identify distractions while executing these tasks, but it pays little attention to dealing successfully with these distractions and persisting in behavior until tasks are completed. Therefore, knowledge is needed on how people deal with time, or more specifically, which work activities they plan for themselves and which they actually complete. From a more practical perspective, this knowledge may be used to develop a successful self-management training program to deal with time problems. One of the tools in time management is making a daily to-do list. It involves making a list of tasks that one intends to complete that day and ticking off the tasks that are completed at the end of the day. The current study builds upon this idea in investigating how people deal with multiple tasks at work.

Planning and Prioritizing Daily Work Tasks

Dealing with multiple tasks at work requires making choices of what to do first and what to do later. Prioritizing is a component of planning behavior and refers to the determination of the order in which the planned tasks or goals will be processed or executed. Relatively little is known about the choices people make about which tasks they will start with, and which tasks they will do later. According to popular time management literature (Covey, 1994; Drucker, 1967; Mackenzie, 1972), a distinction should be made between the importance and urgency of tasks, because they are factors that affect why one task receives a higher priority than another task. In other words, some tasks are important in terms of consequences for quality and quantity of performance (importance), and some have clear

time-related aspects, in that they require immediate action (urgency). The time management advice (e.g., Covey, 1994) is to make this distinction explicitly, because in practice, people tend to consider each new task that arises as the one that is most urgent and start acting on it, instead of considering whether it is really important to do this task now, or more suitable to do later.

A possible explanation for acting on urgent instead of important tasks can be found in theories and memory models on the recency effect. The recency effect refers to the well known phenomenon that words that are at the end of a list are recalled better than words in the middle of the list. The same process applies to events that occurred recently. Recent events influence judgments of people because they are remembered better than earlier events and are therefore viewed as more important (Hintzman, 2003).

Koch and Kleinman (2002) suggested another explanation. They argued that people tend to perform the urgent instead of important tasks as a result of time discounting. Time discounting (the opposite of delay of gratification) is the phenomenon that gains that are obtained later in time are worth less to people. If we can choose between equally attractive events, but one is delayed, we choose the non-delayed one because the present, subjective value of an outcome decreases as the delay to its receipt increases (Koch & Kleinmann, 2002).

The attractiveness of tasks might also be important when studying the priority that people give to tasks. Low task attractiveness or task aversiveness is an important reason for procrastination (Van Eerde, 2000). Procrastination can be seen as a process in which a person does not start on an intended task, but engages in a more attractive, but usually less important task, to avoid starting with the intended task. The above reasoning lead up to our first hypothesis.

Hypothesis 1. The more important (a), urgent (b), and attractive (c) daily tasks are perceived, the higher the priority given.

Completion of Work Plans

The second aim of our research is to explore the extent to which planned tasks are actually completed. As stated, people do not always complete what they had planned for themselves. What factors influence this observed discrepancy between work plans and actions? First, we assume that decisions relevant to planning will influence task completion. The likelihood that a task will be completed may be greater when the order of tasks has been

planned, that is, tasks with a higher priority in the beginning of a workday are more likely to be completed at the end of the workday. Hall & Hursch (1982) studied the completion of high priority tasks of four members of faculty and staff at a university and found that those who participated in discussions about their work strategy, used weekly and daily schedules, and read a time management manual, completed more high priority tasks after the interventions. We expect that people are more focused on completing their high priority tasks than on completing lower priority tasks, and we expect that these tasks are completed to a greater extent by the end of the workday.

Hypothesis 2. The higher the priority of planned tasks, the more planned tasks completed.

Furthermore, next to priority, we wanted to investigate whether the same task characteristics that are most important for planning decisions, are also predictive of planned task completion. In other words, we aimed to investigate whether people complete the planned tasks they perceived as more important, more urgent, and more attractive, to a higher extent than the other planned tasks. Following Koch & Kleinman (2002) who suggested that people tend to perform the urgent tasks first, we also expected perceived task urgency to predict planned task completion, but we also expected that they would complete their important tasks as these tasks contribute to attaining positive job performance evaluations. Finally, we anticipated perceived task attractiveness to predict the completion of planned tasks, as we believe that people generally do first what they find most attractive and enjoyable to do.

Hypothesis 3. The more planned tasks are perceived as important (a), urgent (b), and attractive (c), the more they are completed.

Furthermore, several job and personal characteristics might explain why people do and do not complete their work as planned. As planned task completion can be viewed as part of one's job performance, we studied the literature on work performance to select variables facilitating planned task completion. Roe (1999) reviewed the literature on work performance and listed several variables relevant when studying work performance. He identified, among others, job characteristics and individual differences as important predictors of work performance.

Job characteristics

In this study, the perceived overall workload and the degree to which a person has autonomy in his/her work were studied in relation to planned task completion as they were part of all major task design theories (Hackman & Oldham, 1980, Karasek, 1998; Warr, 1994). Job demands (cf. workload), defined as the psychological stressors that stem from the work environment or workload (Karasek & Theorell, 1990), and job control (cf. job autonomy), defined as the extent to which the job provides freedom, independence, and discretion to the employee in scheduling the work and in determining the procedures to be used to carry it out (Karasek & Theorell, 1990), have been identified as important predictors of work strain (Karasek, 1998), but were also found to be related to employee performance (Braarud, 2001; Marchese & Ryan, 2001). Braarud (2001) found that people's experienced workload was related to their performance, especially when their work involved complex tasks. His study showed that a workload that was perceived as too high it negatively affected people's performance. This finding relates to studies on time pressure (Rastegary & Landy, 1993) that revealed that the relationship between time pressure and performance was curvilinear, which implies that too little and too much time pressure negatively affects performance. Marchese & Ryan, (2001) found that job autonomy was related to performance. Employees with high levels of autonomy had a higher performance than those with lower job autonomy. In other words, when people feel that they have too much work to do and have to work hard to perform their tasks, they may complete less planned work compared to when workload is perceived as low. Also, when workers experience job autonomy, they may complete more planned work, because they have the opportunity to plan the tasks they think they are able to complete on a workday and perform what they had planned for themselves.

Hypothesis 4. The lower the workload, the higher the job autonomy, the more planned tasks completed.

Individual differences

Conscientiousness and emotional stability are among the personality factors that were identified as predictors of performance (see Judge & Bono, 2001, for a meta-analysis; Roe, 1999). Conscientiousness indicates order, dutifulness, discipline, and achievement motivation and was found to relate positively to job performance (Judge & Bono, 2001, Liao & Chuang, 2004). Furthermore, it has been shown that conscientiousness is highly negatively related to procrastination (Van Eerde, 2003) and it is therefore likely that highly conscientious people

complete more planned work because they feel committed to do what they have promised to do, and avoid distractions and interruptions, whereas for those who procrastinate, the opposite applies. Emotional stability has been found to be positively related to job performance (Judge & Bono, 2001). Persons who are more emotionally stable were suggested to be more effective in overcoming obstacles as a result of using better problem solving strategies (Bono & Judge, 2003). Also, they might be more committed and less distracted by their own emotions in their focus on the completion of their planned tasks.

Finally, a previous study by Orpen (1994) found some support for the effect of a time management training program in acquiring skills to make more realistic judgments of what they intend to perform on a workday. Time management training may also enhance the skills that make it more likely that plans are actually completed by the end of a workday (Van Eerde, 2003; Koch & Kleinmann, 2001). The above reasoning lead to our fourth hypothesis.

Hypothesis 5 The more conscientious (a) and emotionally stable (b) people are, as well as having participated in a time management training program (c), the more planned tasks they completed.

Finally, we aimed to study the effects of planning behavior and perceived control of time. People who are used to planning as they generally plan tasks for themselves are supposed to complete their planned tasks to a higher degree, as they might have more insight in the time demands of the planned tasks and therefore plan more realistically. Furthermore, perceived control of time might be an important concept. People who experience a higher degree of perceived control of time, might complete more of their planned work as they focus on managing their time in order to be in control of it. The concept perceived control of time was derived from the time management literature (e.g., Macan, 1994) where it was identified as mediating between setting goals and priorities and several job-related outcomes. In the current study, we investigated its direct effects on the completion of planned tasks.

Hypothesis 6. Planning behavior (a) and perceived control of time (b) positively predict planned task completion.

Overall Method

We designed two studies to investigate our hypotheses. The first study investigated the planning and prioritizing process and the execution of planned tasks in detail in order to identify task, personal, and job characteristics of influence by means of a diary study and survey study. As the diary study forces people to make a daily planning, it might be obtrusive and influence the outcomes to some degree. Although we controlled for this effect, we also designed a second study, based on interviews, in which we gathered qualitative information on people's planning and executing strategies and explored individual differences. We did not expect all people to generally plan their workdays to the same extent and with the same detail. Therefore, we conducted an interview study in order to gather examples of the different kinds of planning and workday start-up behaviors people have, which could also help to explain the results of the diary study.

Study 1

Study Design

We designed a daily diary study to investigate the planning and completion of daily work tasks and workday satisfaction. A diary study allows access to ongoing behavior, which allows the immediacy of the experience to be captured, and also provides accounts of phenomena *over time*. The distinctive feature of the diary as a research tool is that it is completed regularly over time by the respondent, gathering instances of events, feelings as they happen (Symon, 1998). One might argue that a diary study is obtrusive and therefore disturbs normal work routine. Therefore, we used a quasi-experimental set up with a diary and control group to evaluate this effect. In the diary group, respondents filled out a pre-questionnaire, then completed daily diaries, followed by a post questionnaire. Respondents in the control group only completed pre and post questionnaires.

The questionnaires served to collect information on job characteristics and individual differences, but were also used to assess possible changes in planning behavior, perceived control of time, and job performance due to diary keeping.

Participants

The location for this research was the Corporate Headquarters of an international company among world leaders in the manufacturing of advanced technology systems for the semiconductor industry, with more than 50 company sites in 16 countries around the world. The company designs, develops, integrates, markets, and services advanced systems used by

major global semiconductor manufacturers to create chips that power a wide array of electronic, communications, and information technology products.

R&D engineers¹, the participants in this study, worked in one of the major departments of this company in the Netherlands and were highly educated. One hundred and twenty-seven participants were recruited, and randomly assigned to the diary group or to the control group. In the diary group (n = 63), the participants were requested to fill out the diary twice a day over a period of five weeks, during two days a week. They also completed a questionnaire before and after the diary study. In the control group (n = 62), the participants were requested to complete both questionnaires.

Procedure

Each respondent was asked to complete 10 daily diaries. The diary study was set out over a period of five weeks, during two days a week. This frequency was chosen to ensure that participating in the study would not be too much of a burden. The respondents were instructed to choose the Monday and Wednesday in the first week, Tuesday and Thursday the second week, Wednesday and Friday in the third week and so on, to ensure that no bias in choosing particular days would occur. If the selected days were days off, or were spent in an all-day meeting, respondents were requested to select the consecutive day.

Respondents in both groups were asked to complete a questionnaire before and after the diary period. To help to preserve the anonymity of the participants, the questionnaires and diaries were labeled with identification numbers. The first questionnaire was sent out three weeks before the diary study started, the second questionnaire was sent out four weeks after the diary study was completed.

Measures

Diary study. The diary study consisted of three parts. In the first part of the diary, we asked participants to fill out planned tasks and to indicate on a five-point scale the extent to which they considered these tasks to be urgent, important, and attractive, before they started their workday. They were also asked to prioritize these planned tasks. The second part was filled out at the end of a workday and asked for an indication of the percentage completed of each planned task. For tasks that were not completed, participants were asked to note reasons why this had occurred and an indication of possible consequences.

¹ This sample was also used in Chapter 3 of this dissertation.

Furthermore, participants were instructed to add *unplanned* tasks they had performed during the day with an indication of the urgency, importance and attractiveness of these tasks. Also, they were asked to indicate which *work interruptions* came up during their workday and how much time these took altogether. The third part was filled out at the end of a workday as well, where participants indicated (1) whether they had worked overtime, (2) whether they had done the things they wanted to do for today, (3) to estimate what percentage of their time they had spent on planned tasks, unplanned tasks, work interruptions, and private matters. Furthermore, they were asked how satisfied they were with their workday. *Daily work satisfaction* was measured with the Kunin (1998) job satisfaction faces measure, with five different faces to choose from, ranging from a very unhappy (1) to a very happy face (5). The diary design is presented in Appendix A.

Variables only in survey 1.

Conscientiousness, representing being an reliable, orderly person was assessed with the conscientiousness items of the Berkeley Personality Profile (Harary & Donahue, 1994). The Berkeley Personality Profile consists of five scales and a total of 35 items representing an indication of the Big Five Factors. The conscientiousness scale consists of seven-items. Participants responded to each item using a 5-point scale from do not agree at all (1) to completely agree (5). Example item: “I see myself as someone who handles things efficiently”.

Emotional stability, being an emotionally stable person, was assessed with the seven emotional stability items of the Berkeley Personality Profile (Harary & Donahue, 1994). Participants responded to each item using a 5-point Likert-type scale from do not agree at all (1) to completely agree (5). Example item “I see myself as someone who worries a lot” (reversed scoring).

Time management training. Participants indicated whether they had participated in a time management training program ($0=no$; $1=yes$) prior to this study, and if so, in what year.

Workload (perceived) was assessed with an 11-item scale that indicated the subjective experience of task workload; whether a person feels that there is much work to do and whether the work pace is high (Van Veldhoven, Meijman, Broersen, & Fortuin, 1997). Responses were made using 4-point scales from never (0) to always (3). Example item: “Do you need to work fast to finish your work?”.

Job Autonomy, defined as the degree to which the job provides freedom, independence, and discretion to the employee in scheduling the work and in determining the procedures to

be used in carrying it out (Hackman & Oldham, 1975), was assessed with an 11-item scale (Van Veldhoven, Meijman, Broersen, & Fortuin, 1997). Responses were made using 4-point scales from never (0) to always (3). Example item: "Are you free in executing your work the way you want it?". Previous research has demonstrated the good psychometric properties of both perceived workload and job autonomy scales (Van Veldhoven, de Jonge, Broersen, Kompier, & Meijman, 2002).

Variables both in survey 1 and 2.

Planning behavior was measured with an eight-item scale derived from the subscale "Setting goals and priorities" of the Time Management Behavior Scale (Macan, Shahani, Dipboye & Philips, 1990). Based on a previous study, long-term goal-setting items were excluded from the scale (Peeters & Rutte, 2004). The remaining items referred to planning behavior as we defined it; short-term planning and prioritizing tasks. One item of the TMBS was replaced with a planning behavior item of the Time Management Questionnaire (Britton & Tesser, 1991). Examples of items included are: "I set myself short-term goals" and "I plan my daily work activities". Responses were made on a 5-point scale ranging from 'do not agree at all'(1) to 'completely agree'(5).

Perceived control of time. Six items were used to assess the extent to which individuals believe they can directly affect the way they manage their time. As a pilot study revealed that the Dutch translation² of Macan's original scale produced an unreliable scale, we used two out of five original items, and added four new items. Ratings were made on a 5-point scale ranging from 'do not agree at all' (1) to 'completely agree' (5). Factor analysis showed that one item of Macan's scale, "In my work, performing well or not mainly depends on luck", clearly loaded on another factor and was therefore deleted from the scale. The remaining items were: "I feel in control of my time", "I find it difficult to keep to my schedule because others take me away from my work", "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". The explained variance (of the remaining five items) was 41,87%.

Job performance was measured by asking respondents to rate their performance relative to their colleagues (Roe, Zinovieva, Dienes, & ten Horn, 2000). Eight statements, for example "It has been acknowledged that my performance is higher compared to my colleagues" could be rated 'yes, that is true' (1) to 'no, not true' (5). The items were reversely

² The items were translated in Dutch and were translated back to the original language by sworn translators.

scored so that a higher score indicated a higher job performance. One item was deleted, based on low intercorrelations.

Data Analysis

To ensure that the respondents would not be affected in their normal way of working due to using the diary, which would distort our study results, we investigated whether the experimental and control group differed in their planning behavior, perceived control of time, and job performance in the pre and post questionnaires. We therefore performed a 2 (group) x 2 (time) analysis of variance.

To test our first three hypotheses, we performed regression analyses to identify significant predictors of high priority tasks and significant predictors of planned task completion.

The diary design includes constructs measured at different levels, that is task constructs (level 1), day constructs (level 2), and person constructs (level 3). Data were gathered about tasks on a number of workdays of a number of people. This nested structure violates the assumption of independence that is needed for most methods of analysis (Bryck & Raudenbush, 1992). To account for the nested data structure, hierarchical linear modeling or multilevel modeling (Klein & Kozlowski, 2000; Snijders & Bosker, 1999) was performed using MLwiN software (Rasbash et al., 2000). Multilevel models describe the relationship between independent and dependent constructs at different levels of analysis, that is, all levels present in the dataset can be taken into account simultaneously (Snijder & Bosker, 1999).

A multilevel model specifies multilevel determinants (for example, both unit and individual) of single level (for example, individual-level) outcomes when there is a hierarchical data set. In other words, it consists of one single dependent variable that is measured at the lowest level and explanatory variables that are measured at different levels (Klein & Kozlowski, 2000). Multilevel modeling involves a staged approach, that is, step by step the various types of predictor variables are included to build an equation for the dependent variable (Snijders & Bosker, 1999).

As our hypothesis did not require the inclusion of variables at three levels at the same time, constructs on two levels (task and person level) were entered into the models. Multilevel model building starts with the simplest possible model, the intercept-only or 'empty' model. In the second step, all lower level explanatory variables (in our case, task characteristics) are entered into the model. The improvement of the model in the second step

is tested by computing the deviance of this model and comparing it to the previous (intercept-only) model. This difference approximates a chi-square variate with the number of explanatory variables added in step two as degrees of freedom. In the third step, all higher level explanatory variables (person- and job characteristics) are entered into the model which allows for examining whether these variables explain variance in the dependent variable. Again, the global chi-square test to formally test the improvement of the fit can be used³.

In summary, analysis of variance, regression analysis, and multilevel modeling were used to examine the research questions.

Results

Overall, 30 respondents in the diary condition filled out 2 or more diaries, 26 of them (41%) also completed both questionnaires, 3 completed the first questionnaire only.

Most of the respondents were male (83%), were on average 33 years old, worked fulltime with an average of 8,4 hours a day, and 5 respondents had participated in a time management training program 3 to 6 years prior to this study.

In total, 262 diaries were filled out, which covered 1130 tasks. The planned tasks were reported at the start of a working day ($n = 878$), the unplanned tasks were reported at the end of a working day ($n = 252$). Respondents listed an average of 3.7 planned tasks each day and .96 unplanned tasks.

In the control condition, 41 respondents (65%) filled out both questionnaires. Respondents in the control condition were mainly male (93%), had an average age of 33 years, worked fulltime with an average of 8,5 hours a day, and 6 respondents participated in a time management training program 1 to 9 years prior to this study.

Thus, the experimental and control group had similar demographic features.

Descriptive Statistics

Intercorrelations of the variables in the daily diary study at the task level (priority rankings, ratings of importance, urgency, attractiveness, and percentage completed) are presented in Table 1. Intercorrelations among task urgency, task importance, and task attractiveness were moderate. Task urgency and task importance correlated .58, which is below the generally accepted rule of thumb ($r = .70$) for identifying the risk of multicollinearity (Tabachnick & Fidell, 2001).

The variables in the daily diary study at the day level are presented in Table 2.

³ We acknowledge Ad de Jong for his statistical advice.

As can be seen in Table 2, the percentage of time spent on planned tasks was positively related to workday satisfaction ($r = .24, p < .01$), where the percentage of time spent on work interruptions was negatively related ($r = -.24, p < .01$).

Table 1. *Intercorrelations Priority Ranking, Ratings of Importance, Urgency, Attractiveness, and Percentage of Planned Tasks Completed*

	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Priority	-	-	-				
2. Importance	3.93	.87	.29**	-			
3. Urgency	3.53	1.01	.33**	.58**	-		
4. Attractiveness	3.43	.93	.08	.28**	.16**	-	
5. Percentage completed	72.56	39.77	.21**	.04	.11**	.00	-

* $p < .05$, ** $p < .01$ $n = 878$.

Table 2. *Intercorrelations Percentage of Time Spent on Planned Tasks, Time Spent on Unplanned Tasks, Time Spent on Interruptions, and Workday Satisfaction*

	<i>M</i>	<i>SD</i>	1	2	3	4
1. % Time spent on planned tasks	77.49	20.31	-			
2. % Time spent on unplanned tasks	15.53	17.23	-.80**	-		
3. % Time spent on interruptions	5.40	8.75	-.47**	.02	-	
4. Workday satisfaction	3.76	.81	.24**	-.12	-.24**	-

* $p < .05$, ** $p < .01$ $n = 245$.

In Table 3, the means, standard deviations, coefficients alpha, and inter-correlations among the survey variables are presented. All coefficient alphas of the survey variables were inspected and were satisfactory (above .70, Nunnally, 1978), except for the conscientiousness scale where the coefficient alpha was .68. As other studies have demonstrated the reliability and validity of this measure (Harary & Donahue, 1994), we used the unchanged conscientious scale in our study.

Table 3. *Intercorrelations among pre-survey variables included in multilevel analysis*
(*n* = 30)

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. Workload	2.38	.39	(.83)						
2. Job autonomy	3.10	.38	.02	(.74)					
3. TM training	-	-	-.07	-.10	-				
4. Conscientiousness	3.62	.50	-.04	-.29	.24	(.68)			
5. Emotional stability	3.39	.50	.10	-.01	-.04	-.34	(.74)		
6. Planning behavior	3.52	.45	.19	.37*	-.14	-.11	-.07	(.72)	
7. Perceived control of time	3.73	.87	-.43*	.30	.37*	.11	-.15	.16	(.73)

Note. TM= time management. Figures in parentheses are alpha reliabilities.

* $p < .05$, ** $p < .01$

Evaluation Diary Method

A multivariate 2 (group) x 2 (time) analysis of variance (MANOVA) was performed to evaluate whether the respondents in the diary group changed over time in comparison to those in the control condition due to the diary condition. Three dependent variables were examined: planning behavior, perceived control of time, and job performance. MANOVA results showed that pre- and post-questionnaire results on the dependent variables of respondents in the diary condition did not significantly differ from the control condition (Wilks' $\Lambda = .90$, $F(10,51) = 0.59$, $p = .812$). These results imply that the diary study did not affect the diary group and the diary study itself can therefore not be viewed as influencing our study results.

Planning and Prioritizing Tasks

Our first hypothesis concerned how respondents in the diary condition prioritize their planned activities according to the different task dimensions (importance, urgency, and attractiveness). We expected (*H1*) that perceived task importance, urgency, and attractiveness predicted task priority. Since the variables included were all measured on the same level of analysis, we report the results of regression analyses. Regressing task priority ranking analysis on task importance, task urgency, and task attractiveness showed that respondents prioritized their planned activities according to task urgency ($\beta = .24$, $p < .001$) and task importance ($\beta = .15$, $p < .001$), and did not prioritize their tasks based on task attractiveness

($\beta = .00, p = .99$). Thus, the more urgent and the more important the tasks were perceived, the higher the task priority. The model explained 12% of the total variance ($R^2 = .12$, adjusted $R^2 = .12$). Thus, *H1* was only partially supported.

Completing Planned Tasks

Our second and third hypothesis concerned whether planned activities were completed by the end of a workday. On average, 73% of each of the planned tasks were completed by the end of a workday. To investigate the relation between task priority and planned task completion, we performed a hierarchical regression analysis where we first regressed the percentage of task completion on task priority. Furthermore, as we aimed to investigate the direct effects of task importance, task urgency, and task attractiveness on planned task completion, we added these predictors in the second step. Results showed that task priority

($\beta = .21, p < .001$) predicted planned task completion ($R^2 = .04$, adjusted $R^2 = .04$). Thus the higher the task priority, the more the task was completed, confirming *H2*.

Furthermore, results showed that task importance ($\beta = -.20, p < .001$) and task urgency ($\beta = .16, p < .001$) also significantly predicted planned task completion ($R^2 = .07$, adjusted $R^2 = .06$). The more urgent the planned tasks were perceived, the more they were completed, yet surprisingly, importance was negatively related to planned tasks completion. Again, task attractiveness was not a significant predictor ($\beta = .02, n.s.$). Thus, respondents indicated that they completed their highest priority tasks to a greater extent than lower priority tasks. However, they also tended to complete more urgent, yet less important tasks to a greater extent than other tasks, thus *H3* could only partially be confirmed.

In the diaries, respondents could indicate reasons for not completing their planned tasks. Reasons mentioned were: no time (for instance because start up time is high) (42%), many unplanned tasks (18%), being interrupted by others (questions, lack of information, unprepared meetings and so on) (17%), and other reasons (23%). The diaries also revealed that unplanned tasks and work interruptions consisted of telephone calls (31%), colleagues walking in and asking questions and unexpected (informal) meetings (25%), broken or lost working materials (17%), unexpected tasks due to clients (13%), private matters (6%), looking for a parking space (4%), and miscellaneous (4%). On average, those who mentioned interruptions (17 respondents) reported a mean of 96 minutes of work interruptions a day, which was almost 20% of their total work time, with a maximum of 300 minutes.

Additional results showed that, when compared to completing planned tasks, a higher percentage of the unplanned tasks were completed by the end of a workday ($m = 72,56$ vs. $m = 81,23$, $t = 2,975$, $p < .01$). Furthermore, unplanned tasks were judged as more urgent ($m = 4.15$ vs. $m = 3.93$, $t = 4.79$, $p < .001$) and more important ($m = 3.93$ vs. $m = 3.53$, $t = 3.50$, $p < .001$) than planned tasks, and equally attractive ($m = 3.37$ vs. $m = 3.43$, $t = -.69$, n.s.). The percentage of unplanned tasks completed was positively predicted by task urgency ($\beta = .33$, $p < .001$) and negatively by task attractiveness ($\beta = -.14$, $p < .05$) ($R^2 = .11$, adjusted $R^2 = .10$). Task importance did not significantly predict unplanned task completion ($\beta = -.10$, n.s.). In other words, unplanned tasks were completed to a higher extent than planned tasks and were perceived as more urgent and less attractive than planned tasks⁴.

Individual Differences in Completing Planned Tasks: Multilevel Analysis

Hypothesis 4, 5 and 6 were based on the relation between the diary entries and individual survey results. What predicts the extent to which planned tasks are completed? We investigated whether task dimensions predicted planned task completion and whether work, and personal characteristics were significant predictors. Using multilevel modeling, three models were tested: an intercept-only model, a model that included task-level variables, and a model that included both task and individual level variables. In Table 4, the multilevel results are given.

In model B, the task-level variables were included. The findings of model B indicate a significant difference in the fit parameter, the $-2 \cdot \log$ likelihood. In model C, the individual-level variables were included. Model C reveals a significant difference in $-2 \cdot \log$ likelihood, implying that inclusion of the individual level variable results in a significantly improved model.

It was found that for planned task completion, higher priority tasks, and more urgent, yet less important planned tasks were completed to a higher degree than the other tasks. Furthermore, respondents who were more conscientious and emotionally stable or had participated in a time management training program prior to this study (six respondents) tended to complete more of their planned work. The other variables proposed were non-significant.

To summarize our results and to give more insight in the results, we calculated standardized β -coefficients, which are displayed in Figure 1.

⁴ We did not ask respondents to indicate the priority of unplanned tasks.

Table 4. *Multi-Level Analysis Results Planned Task Completion*

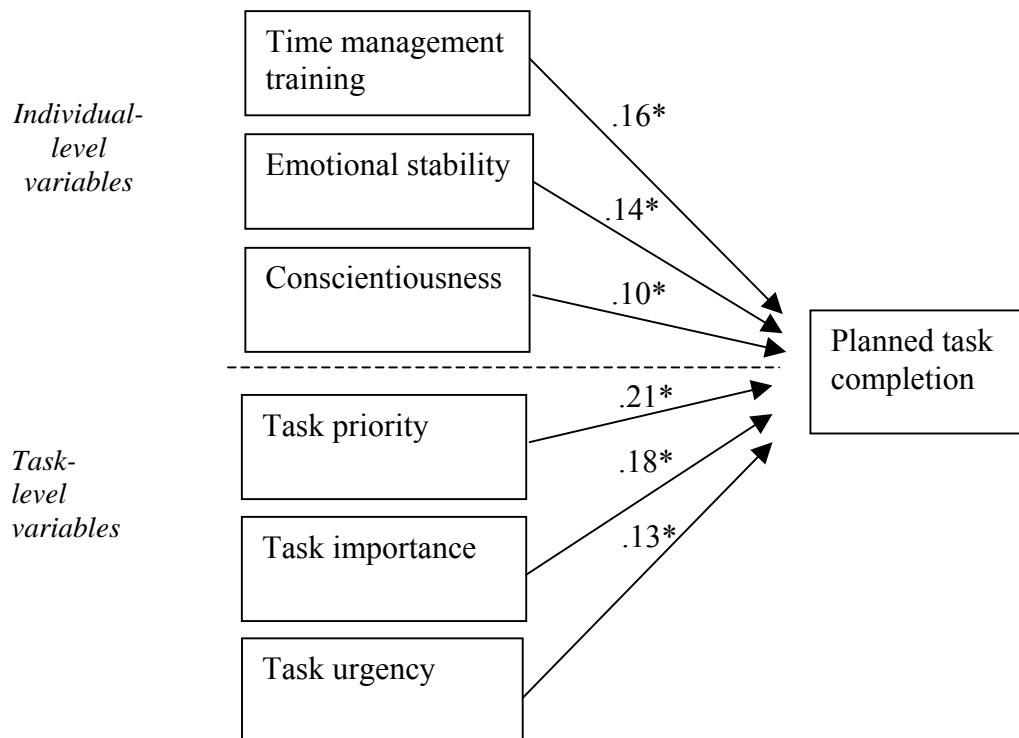
	Model A	Model B	Model C	H
	Fixed part ^a			
Intercept (γ_{00})	72,277 (2,412)	66,407 (6,084)	62,232 (5,867)	
<i>Task-level coefficients</i>				
High priority task (γ_{10})		5,743 (1,104)*	5,922 (1,120)*	2
Task importance (γ_{20})		-5,732 (1,826)*	-5,704 (1,857)*	3a
Task urgency (γ_{30})		5,161 (1,616)*	5,179 (1,643)*	3b
Task attractiveness (γ_{40})		0,936 (1,482)	1,134 (1,523)	3c
<i>Individual-level coefficients</i>				
Workload (γ_{01})			-7,828 (7,890)	4a
Job autonomy (γ_{02})			-5,683 (6,188)	4b
Conscientiousness (γ_{03})			8,389 (4,171)*	5a
Emotional stability (γ_{04})			10,391 (3,817)*	5b
Time management training (γ_{05})			16,414 (4,967)*	5c
Planning behavior (γ_{06})			5,187 (4,949)	6a
Perceived control of time (γ_{07})			4,189 (3,563)	6b
	Random part			
$\sigma\epsilon^2$ (task-level variance)	1474,244 (74,624)	1423,836 (70,057)	1421,530 (73,169)	
$\sigma\omega^2$ (individual-level variance)	104,764 (43,232)	104,255 (44,668)	50,972 (28,261)	
	Model fit			
-2*loglikelihood (IGLS)	8218,09	8170,11	7889,42	
Δ -2*loglikelihood		47,98	280,69	
Δdf		4	7	
Explained variance (%)				
Task-level		25,4%	28,2%	
Individual-level			53,8%	

Note. H = hypothesis number

* $p < 0.05$ ** $p < 0.01$

^a Unstandardized regression coefficients presented under model A, B, and C. Standard errors between parentheses.

Figure 1. Path diagram with standardized β -coefficients of significant predictors of planned task completion.



* $p < .05$

Conclusion and discussion Study 1

The aim of our first study was to investigate how people prioritize and complete their daily work tasks. First, we investigated what task dimensions (importance, urgency, and attractiveness of tasks) predicted task priority. Results showed that people prioritized their tasks according to perceived task importance and task urgency, and not according to task attractiveness. In other words, more important and more urgent tasks were given the highest priority ratings.

Second, we investigated which planned tasks were completed by the end of a workday. Results showed that not all planned tasks were completed by the end of a workday. We investigated, besides task priority, whether perceived task importance, task urgency, and task attractiveness of tasks, and several work characteristics (workload and job autonomy) and personal characteristics (conscientiousness, emotional stability, and time management training) influenced planned task completion. In addition, we investigated whether planning behavior and perceived control of time predicted planned task completion. Multilevel analysis results showed that more urgent and less important tasks were completed by the end

of a workday and revealed that more conscientious and emotionally stable people completed more of their planned work than others. Also, those who participated in a time management training program prior to this study completed more of their planned work than others. Although only six respondents had participated in a time management training program, this variable turned out to be a significant predictor of planned task completion.

High priority tasks were rated as more important and more urgent, which is in line with popular time management notions. Also in line with these notions, respondents completed more urgent and less important planned tasks, and unplanned tasks that they perceived as more urgent (yet less attractive). This finding is in line with studies on time discounting (e.g., Koch & Kleinmann, 2002). This is one of the few studies that actually used task completion as a dependent variable. Most studies on time discounting use choice or preferences, rather than action.

Additionally, we investigated why planned tasks were not fully completed. Respondents could indicate why they were not able to complete their work as planned. Also, they indicated work interruptions and unplanned tasks. Unplanned tasks were rated as more urgent and less important than planned tasks and were completed to a higher degree than planned tasks.

Unplanned tasks may be perceived as more urgent than planned tasks, because they arrived more recently. This recency-effect may also influence the importance of the tasks. There may be a trade-off between planned and unplanned tasks. Unplanned tasks may function as a welcome distraction of work, but they may also be perceived as work interruptions which implies the postponement of ongoing tasks or activities (Zijlstra et al., 1999, Cellier & Eyrolle, 1992). It is likely that time spent on unplanned tasks leads to a lower completion rate of planned tasks as there is “time needed for the ‘change-over’ from the interrupting task to the main task, as well as for the resumption of the main task” (Zijlstra et al., 1999, pp. 182). Zijlstra et al. also noted that the length of time needed for the changeover and resumption of tasks increases when interruptions involved complex tasks, as they might involve complex cognitive processes of which it is less easy to disengage from. They also found that most people appeared to dislike work interruptions. In our study, those who mentioned interruptions reported a mean of 96 minutes of work interruptions a day with a maximum of 300 minutes, which was almost 20% of their total work time. This finding is in line with, for instance, the study of Zijlstra et al. (1999) that found a total interruption time of 25% among secretaries. Results of our study also showed that spending more time on planned

tasks and less time on work interruptions was positively related to workday satisfaction. Apparently, these R&D engineers preferred workdays that were predictable to some degree.

Contrary to our expectation, workload, job autonomy, planning behavior, and perceived control of time were non-significant in predicting planned task completion. This finding is not in line with past studies on job performance. A possible explanation can be found in our study as it showed that respondents had to perform both planned and unplanned tasks and had to deal with interruptions, which implies that one's job performance consist of more aspects than planned task completion.

There are several limitations to the current study. The current study had a rather small sample size and the generalizability of the current findings to other samples and organizational settings may be limited. That is, participants in the current study were engineers working in rather similar jobs, and a selection effect may have taken place. Research is needed to determine the extent to which the present findings generalize to other work situations. On the other hand, as we found that respondent differed in the personality characteristics conscientiousness and emotional stability, this selection effect may be limited.

A second concern is that diary data were collected only over a maximum of 10 days. Although subjects indicated that the diary collection days were typical workdays, there is still a chance that this sample of days may nevertheless not be representative for their other workdays. To overcome this limitation, all workdays should be included in a future diary study. On the other hand, this frequency might interfere with normal way of working.

A third concern relates to the validity of self-reported data used in this study. As expressed by critics of self-report questionnaires (cf. Crampton & Wagner, 1994), the general concern regarding the use of self-report measures is that measures of covariation are artificially elevated, producing percept-percept inflation. If percept-percept inflation were to occur, one would expect that measures of covariation for all relationships would be elevated. However, in this study, not all relations were found to be significant and therefore it is not highly likely that significant results were due to this artifact.

A fourth concern is that we did not gather information about the order or duration of task execution. Perhaps people started working on the urgent tasks (and perhaps less important tasks) and only after that completed other, important, tasks which might explain why their urgent, unimportant tasks are completed to a higher degree than the tasks that they had rated as important. Future studies could focus on the working order and workday start-up behaviors in order to investigate this possible explanation for the result of the current study.

Finally, another limitation of the current study lies in the fact that only certain individual-level variables (e.g., job and personal characteristics) were examined as possible predictors of outcome variables. Other variables, related to expectancy and self-efficacy are also likely to be important in planned task completion (cf. Holman, Totterdell, & Rogelberg, 2003).

However, our daily diary study turned out to be a very useful research method when studying work behavior. As Bolger, Davis, Rafaeli (2003) stated, a diary method is a method that can be used to capture life as it is lived and allows for multiple statistical analysis methods.

Study 2

In this study, we intended to overcome some of the limitations of the diary study presented in Study 1. The goal of this study was to gather detailed information about the planning and executing process in order to investigate individual differences which might also explain some of the results of the diary study. More specifically, we aimed to study the planning and prioritizing process, workday start-up behaviors, and how employees generally decided on how to execute their tasks during workdays.

Sample and procedure

Structured interviews were conducted by the first author among 17 employees working in seven organizations (four service companies, three production companies) in the Netherlands. Similar to the respondents in Study 1, they worked in autonomous jobs. They were randomly selected from a subset of employees who were assigned to jobs with a high degree of autonomy. We also set this criterion since low autonomy reduces the room for time management as employees might not have the opportunity, to a certain degree, to plan and execute their work as they preferred. Based on this criterion, employees were selected by either a supervisor or a personnel manager. The interviewed group consisted of consultants, project managers, account managers, sales managers, engineers, and personnel officers. The interviews were conducted at their workplace. Each person was interviewed for one to two hours. All but two were men. Their age ranged from 25 to 50 years. They all had fulltime jobs and had worked between one and 14 years in their current position. It was agreed that, because of the small number of interviewees in each company, results would not be reported to the company and interviewees were made aware of this.

Measures

Structured interviews provided information on four topics: (1) planning and prioritizing behaviors, (2) workday start-up behaviors, (3) work behaviors while executing their work tasks, and (4) an indication of respondents' overall work style. Respondents were also asked to indicate whether they were satisfied with their work style and whether they would recommend their work style to others working in similar jobs. Questions included: "What do you do when you start working?", "Do you plan tasks for yourself?", "Do you set priorities?", "What kind of tasks do you work on first?", "How would you describe your personal work style?". Interviews were taped and transcribed.

Results

Data analysis

We first read through our data to get an idea of the variations and similarities in planning, prioritizing, execution strategies, and overall work styles. Turning to a more systematic qualitative analysis, the first author arranged the different parts of the interviews under a provisional category in the emerging set of categories. Then the second author reviewed the categories and also arranged the interviews among them and discussed the categories with the first author. This resulted in the establishment of the final categories.

Planning and prioritizing

With respect to planning, four different categories were found. These categories were (1) planning at the beginning or end of each workday, (2) planning a week ahead, (3) planning occasionally, only when necessary, and (4) no planning.

Most of the respondents (41 %) reviewed and planned their tasks at the beginning of their workday, some of which also noted tasks at the end of their workday. One person preferred to plan his tasks the night before he went to work because "I am good at organizing my work, I never leave work till the last moment. I know quite a few scheduled items by heart, project meetings and such like, and I plan my appointments with these meetings in mind. Furthermore, as I'm very aware of my tasks and roughly know when I have to do what, I like to think the night before work about what I should be doing the following day". Another interviewee said: "I can't just start working, I have to think and decide first what tasks I need to complete that day. I pay attention to the deadlines of the projects that I'm working on. When something is due on Friday, I have to start working on it on Tuesday. Because unexpected and mostly highly urgent tasks and activities come up

everyday, I have to plan my tasks every day and fit the unexpected tasks into the planned-tasks list". The interviewees in this category indicated that they preferred this kind of short-range planning because it allowed them to be flexible in work and they could adapt to unexpected events quickly, without losing overview of the tasks that they also needed to perform. Furthermore, because daily planning allowed them to write down detailed tasks (as opposed to weekly planning where one would write down: complete project X), they felt that they had a lower chance of forgetting things and had a more realistic to-do list, because they could take a view of the different parts of the tasks they had to perform.

The second category consisted of those who preferred planning a week or more ahead (29 %). One interviewee said: "I plan my tasks weekly so that I have an overview of what I need to do. If I would plan them daily, I run the risk of forgetting important things. Also, I can now use my weekly planning as a discussion point in our weekly staff and management meeting instead of having to prepare a task overview". The interviewees in this category indicated that they preferred weekly, two-weekly or monthly planning because with daily planning, one tends to focus on tasks of which the deadline is near and one could lose track of more distal tasks that are also important to keep in mind. Some also indicated that, for instance, their weekly planning consisted of noting the topics they wanted to work on with a global indication of when to work on what subject. They felt that this global planning allowed for flexibility in when to do what, depending on the available information, the order of and the combination of tasks in task execution or on one's energy level and motivation to perform the tasks. Some felt that in this way, they were able to use their time most efficiently, or as one interviewee said: "To keep a planning up to date also takes a lot of your time that could be used to complete tasks. So, detailed planning is actually a waste of valuable time".

Respondents in the third category (two respondents, 12%) indicated that they only sometimes planned their tasks, only when necessary, either because they had too much work to do and had trouble deciding what tasks to perform first, or when they felt that they would forget to do certain things.

The fourth category consisted of three respondents who indicated that they did not plan at all (18 %). "It is of no use to plan my tasks, I would never be able to perform what it is on my lists because I'm interrupted most of the day. Therefore, I stopped thinking of what I wanted to do today or this week. I just see what the week brings. I like it this way, it is more 'me' to do so".

Striking was that of the 14 respondents who indicated that they did plan (either daily, weekly, or only occasionally), quite a few respondents (43 %) indicated that they did not plan their tasks explicitly (they only thought about the tasks they had or wanted to perform but did not write them down), because they had all they wanted to do in their mind, “I never make to-do lists, I just remember the things I have to do and plan when to do them in my mind. When I would make a to-do list, I wouldn’t know where I had put it after I made it”.

With respect to prioritizing, all but one respondent indicated that they prioritized their planned tasks. However, we did find that most prioritized (11 interviewees) according to the urgency of tasks, the tasks that needed to be completed first because of the proximal deadline. Others prioritized according to customers demands (tasks that were related to customers were always performed first even though they were not the most urgent or important ones), tasks that they had promised to others to perform, or based on the task volume (tasks that would take a lot of time were always performed first). The respondent that did not prioritize tasks did so because he or she only decided to work on certain tasks during the workday depending on the time of day, work interruptions, task content, energy level and so on, but not based on a rationale. Each day was therefore different which made work more interesting, according to this respondent.

Workday start-up behaviors

We found three different workday start-up behaviors, two of which showed similarities.

Respondents in the first group (41 %) indicated that after they had turned on their computer, they either first wrote down or thought about their tasks for the day (planning), then read their e-mail and other mail, and started working.

The second group resembled the first group, however, skipped the planning part (35 %). They indicated that they turned on their computer, read their (e-)mail, had coffee, and started working. In other words, they did not need an overview of the tasks of the day first to start-up their workday. Some acknowledged that the content of their e-mails affected which tasks to perform first, others read through their e-mails and took up the work whenever they felt ready for it during their workday.

Respondents in the last group (24%) started their workday quite differently from the first two groups. They indicated that they started their workday with social contacts, drinking coffee together, greeting everyone and after that turned on their computer and so on and started working. Reasons that they indicated were that this social event was part of their

work strategy: it allowed them to get in touch with important information from co-workers, but also gave people the opportunity to tell what was on their mind or to get their input on problems that need to be solved or things that need to be changed. It was on the one hand good for work morale, and on the other hand, a good way to detect possible problems or inefficient work processes in an early stage, when it might be possible to solve things within a short space of time or with minimal changes. One respondent stated that it was due to the nature of their work that they had to start with this social event. Because there was noise from production machines and because people worked in different rooms and also had different break-times, they could hardly have any social contact while working. So the social start-up was for social contact as well as for discussing things related to the shop floor.

Execution behaviors

Respondents were asked what kind of tasks they normally performed first in their task execution. We found five different categories, (1) to start with large, difficult tasks, (2) no fixed order, (3) to start with small, enjoyable tasks, (4) to start with tasks that were important to others, (5) to start with tasks that they would otherwise not get to during the rest of the day.

Most respondents (59%) indicated that they preferred to start with large, difficult tasks (category 1) because they were best able to concentrate in the morning, felt relieved when these tasks were finished, or felt that it was most efficient to do large tasks first.

The second largest group (24%) consisted of those who did not have a normal routine in starting-up tasks and preferred to have no fixed order in which they worked on their tasks (category 2). In other words, respondents in this group might perform the tasks as they come up.

The third group (category 3) indicated that they preferred to start with performing small, enjoyable or short-cycle tasks (18%). They indicated several reasons: they needed some pressure to be able to work on large, difficult tasks, it got them in the right mindset to be able to work on tasks that required concentration, they could cross these tasks of their list which gave them a sense of accomplishment as they felt that they had already completed many things on their list.

An equal number of respondents as in the third group (18%) indicated that they liked to start up their workday with tasks that were important to other workers (category 4), in order to facilitate cooperation. In this way, respondents felt that they facilitated meeting deadlines, made a good impression on others, or thought that it was most efficient to do so

because others did not have to wait for information to do their part of the job which also may increase reciprocity: others might do the same for them.

Finally, one person indicated that he preferred to perform tasks that he knew he would not get to during the rest of his workday (category 5) because of work interruptions or other important and urgent tasks or due to a lack of opportunities to concentrate on these tasks. This start-up did not involve either small or large tasks, and we viewed it as a separate category.

Individual planning- and execution styles

When we asked respondents to summarize their planning- and execution styles, we found four different styles, a semi-conscious yet unstructured way of working, (category 1), a conscious and very structured planning- and executing style (category 2), an unstructured, unconscious way of working (category 3), and unstructured, yet conscious planning- and execution style (category 4).

Eight respondents indicated that they consciously looked further ahead than today and adjusted the execution of their tasks accordingly, but further let things take their course and did not have a structured routine. Five of these respondents focused on project deadlines or paid attention to their targets for the coming year. Some stated that this work style allowed them to choose the work they felt like doing, and as a consequence felt more motivated and better able to perform these tasks. Others mentioned that their way of working fitted the nature of their job. They indicated that their job included many work interruptions, such as customers phoning to say that they preferred a different product than they previously indicated or a lack of information from co-workers, which may lead to changes in any plan. This led them to believe that their style of working was most appropriate for their type of job. "I always look further ahead than today and try not to execute everything that comes my way immediately. I always quickly assess whether I, for instance, should pick up the phone now and whether I should execute certain unexpected urgent tasks now, but I also want to be flexible in executing the tasks I feel like doing first".

The second group consisted of those who preferred a highly structured way of working because they felt that in this way, they were able to use their time most efficiently (category 2). "Everyday, I check my deadlines and appointments and then decide what I will execute today and the following days. I can be quite harsh and turn down requests for new and unexpected tasks because they don't fit into my planning. I don't like it when the day turns out to be different from what I had planned". Respondents in this group preferred to

perform what they had set out to do and assess the importance and urgency of new tasks consciously when deciding when to perform these tasks, either later that day or the following workday, in order to ensure that they could execute their work as planned. The main reason for this work style, as they indicated, was that they disliked wasting their time and felt that they made the best use of their time by working systematically.

The third group (2 respondents) preferred an unstructured, unconscious way of working. They executed their work without being aware of or thinking about what to do when and how to do it. However, they did feel responsible for their job and wanted to deliver high quality work, but did not want to work systematically, as they disliked doing so. One interviewee stated: “I think my work experience allows me to work this way, I find myself doing the things I need to do without reviewing them all the time. It regularly occurs that I have to postpone deadlines, but I think that it is mostly not due to my style of working but due to other people’s work style because they don’t pay attention to their deadlines”.

One respondent felt that he or she did not have a structured way of working at all, but did so consciously, as opposed to the third group. Therefore, we viewed this as a different planning- and execution style.

When we asked respondents to indicate whether they were satisfied with their planning- and execution style, they almost all indicated that they felt that their style suited their own preferred way of working, instead of it being imposed by the nature of their job, and therefore it worked well for them. However, they also felt that people differed extensively in their way of working and thus in their planning- and execution styles. “The work style I employ wouldn’t work for anyone else, because we are all so different”. Most indicated that a work style is based on personality characteristics but also based on one’s experiences at work and that it develops and changes over time. Almost all (76%) were satisfied with their planning- and execution style, with hardly any difference between those who worked either in a structured or unstructured way. Two respondents indicated that they were satisfied with their way of working most of the time, but for some tasks or projects it would be best if they were able to work differently (either more or less structured) which they found hard to do.

Surprisingly, those who were satisfied with their planning- and execution style would not recommend it to colleagues who had to perform the same kind of job, again because they felt that it wouldn’t be possible due to the individual differences.

Conclusion and discussion Study 2

In Study 2, we found some evidence for individual differences in planning and executing styles. Results showed that respondents differed in the planning and prioritizing of their daily tasks. Some preferred to plan daily or weekly whereas others preferred to plan occasionally or even preferred not to plan at all. They also differed in their workday start-up behaviors although these differences were less apparent as two out of three categories were similar to some extent. With respect to execution behaviors, we found individual differences in the type of task (e.g., large and difficult versus small and enjoyable) they preferred to perform first. Furthermore, we found that they either preferred a structured versus a non-structured way of working regarding time and that they differed in the extent to which they were conscious versus unconscious of their planning and execution styles. We found that most respondents kept the deadlines of their work in mind and adapted their tasks to be executed accordingly. We were able to distinguish between some of the planning and execution styles although the different categories were not always exhaustive. In future studies, the categorization of planning and executing styles could be further investigated. One possibility is to set up a brainstorm session with workers from different organizations in order to establish all possible planning and executing categories.

One limitation of the current study is the fact that only 17 people were interviewed which could account for a biased or limited view on the planning and executing process. On the other hand, as the respondents originated from seven different organizations, this biased or limited view might be less evident. A second limitation is the classification of respondents answers which might be arbitrary. As this study had an exploratory nature, we did not intend to establish a comprehensive list of categories and to investigate the interrater agreement and reliability. Future studies could focus on establishing these categories and investigating the interrater agreement.

In conclusion, the interview data yielded some detailed information on the different planning and execution styles people engage in spontaneously.

Overall conclusion and discussion

We conducted two studies to investigate the planning process and the execution of (planned) tasks. Study 1 indicated which concepts significantly predicted task priority and the completion of planned tasks, however, as we forced respondents to plan, we possibly studied a limited part of their work behavior. In Study 2, we asked respondents to react spontaneously on questions about the preparation and execution of work tasks which would

give more insight in the results of Study 1 on the one hand, but could also be used to design future diary studies to capture all relevant concepts on the other hand.

Results showed that Study 2 added to the information gathered in Study 1, as we found that people differed in their planning behavior. Where some interviewees regularly planned tasks for themselves, others planned tasks on a less regular basis, only when they felt it was necessary, or even preferred not to plan at all. However, as all respondents in Study 2 indicated that they did prioritize their tasks, they did think about what tasks they wanted to perform which could imply that they planned implicitly. Also, with respect to the execution of tasks, Study 2 added to the information of Study 1. In Study 1, we found that people completed their high priority tasks to a higher extent than lower priority tasks. Furthermore, they completed more urgent and less important tasks to a higher extent than other tasks, which we did not expect. In Study 2, we found that respondents differed in the type of tasks they normally performed first during workdays which might explain what they completed at the end of the workday. Whereas, for instance, some preferred to start with large, difficult tasks, others preferred to perform small, enjoyable tasks first or had no fixed order in the execution of tasks. It seems reasonable to assume that these tasks differ in their task importance and urgency, which implies that some might perform important and urgent tasks first whereas others might perform less important and for instance more urgent tasks first. As we did not ask the respondents in Study 1 what kind of tasks they performed first during their workday, we can only speculate about these type of tasks.

Study 2 gave us some insight in the order of task execution. Future diary studies could take this point into account as the type of task and the order of task execution might predict the completion of planned tasks. Furthermore, as the diary study focused on how people deal with their tasks on a daily basis, we did not gather information about how they dealt with tasks on a weekly or monthly basis. In Study 2, we asked respondents to summarize their planning- and execution styles which revealed individual differences. Here we found, for instance, that some looked further ahead than today, whereas others preferred to focus on one day at a time. These individual differences might also affect the completion of planned tasks. We propose that future diary studies focus on these individual differences as they might explain what people plan and perform during workdays. This can be done with questionnaires, prior to a diary study, in which these individual differences can be assessed and the results can be used to distinguish between the different types of respondents. In this way, the diary results of the different types of respondents can be compared which might give more insight in the different workday behaviors.

The diary study demonstrated that respondents planned and prioritized their daily work tasks according to their perceived task importance and urgency, which is in line with popular time management notions. However, as for the execution of planned tasks, they performed their high priority tasks, but besides that, they tended to perform the more urgent yet less important tasks. Overall, they were able to complete a large part of their work as planned, although work interruptions and unplanned tasks came up during workdays.

Although past studies (e.g., Orpen, 1994; Macan, 1996) were mixed in finding a relation between time management training and job performance, the current study demonstrated that time management positively affected the completion of planned tasks. Multilevel analysis demonstrated that time management training and the personal characteristics of conscientiousness and emotional stability were positively related to the completion of planned tasks. This finding is in line with Judge & Bono (2001) who demonstrated a positive effect of these personal characteristics on job performance. Contrary to our expectations, we did not find a significant effect of job characteristics, planning behavior, or perceived control of time on planned task completion. A possible explanation is that people's overall job performance consists of the completion of planned and unplanned tasks. It may be that the variables that appeared non-significant in the current study would play a role when we had studied respondents' overall performance. Future studies should investigate this further.

As for the results of the interview study, we gathered information on the individual differences in planning and executing work tasks. We found that respondents mainly differed in their preference for a structured versus non-structured way of working and their conscious awareness of their personal way of working. Where some preferred to look ahead and execute their work as planned, others preferred to let things take their course and to constantly adapt to the demands of their work situation.

In conclusion, Study 1 and 2 gave us more insight into the planning, prioritizing, and execution of daily work tasks.

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Managing Time at Work:
Perceived Control of Time and Occupational Self-Efficacy
Mediating between Time Management Behaviors
and Job-Related Outcomes*

This study introduced a time management model in which perceived control of time and occupational self-efficacy partially mediated the relation between time management behaviors on the one hand and performance and well-being outcomes on the other hand. The results showed support for the suggested model and demonstrated that time management behaviors were differentially related to perceived control of time and occupational self-efficacy. Also, results showed that perceived control of time significantly predicted all job-related outcomes, whereas occupational self-efficacy only predicted some of these. Some of the time management behaviors were found to be directly related to performance and well-being outcomes.

* This Chapter is based on: Claessens, Rutte, van Eerde, Roe, & Croon (2004). Managing time at work: Perceived control of time and occupational self-efficacy mediating between time management behaviors and job-related outcomes. Manuscript submitted for publication.

Particularly in the last twenty years, there has been a growing pressure on employees' knowledge, skills, and competencies as a result of expanding global competition and increased demands for immediate availability of products and services (Orlikowsky & Yates, 2002). Especially the ability to use time efficiently; to produce an outcome with a minimal waste of time, is currently an increasingly important skill in work settings as well as in academic and clinical settings (Kelly, 2002).

Decennia ago, time management was introduced as the best way to increase one's efficient use of time (e.g., Lakein, 1973). Authors postulated that engaging in time management behavior was the preferred coping strategy for dealing with time issues on the job and in personal life. Although nowadays many workers participate in time management training programs, read time management books, or at least know a few things about time management, surprisingly little scientific research has been devoted to the effects of time management at work (for a review, see Claessens, van Eerde, Rutte, & Roe, 2004, Chapter 2). Also, these studies have only found limited support for positive effects on well-being and performance.

Macan (1994) was the first to investigate a theoretical model of time management. In her model, perceived control of time mediated the relation between time management behaviors on the one hand and outcome variables such as job satisfaction on the other hand. Claessens, van Eerde, Rutte, and Roe (in press) elaborated on this study and tested a mediation model that consisted of one type of time management behaviors (planning behavior) and job characteristics (workload and job autonomy) on the one hand and job performance, job satisfaction, and work strain on the other hand with data gathered in two waves. They found that perceived control of time partially mediated the relation between planning behavior and job characteristics on the one hand, and job-related outcomes on the other hand. In addition, they found a direct, positive, relation between planning behavior and job performance, and a direct relation between workload, work strain and job satisfaction.

One limitation of their study was its narrow focus on planning behavior as a form of time management behavior. In our view, time management is much broader and encompasses several behaviors, including assessing tasks to decide which tasks to accept and perform, and monitoring one's progress with respect to time. Also, Claessens et al. had a limited operationalization of planning behavior, which gave little information about the different aspects of planning that people might engage in, such as the extent to which people plan details, and the relation with job performance. Secondly, they emphasized the important role of perceived control of time as a mediator between, among other things, planning behavior

and outcomes. This raises the question whether perceived control of time is conceptually and empirically different from a theoretically related control construct, occupational self-efficacy. Thirdly, they only included self-reported job performance which could lead to a biased view on performance. In the current study, we aimed to elaborate on their research in order to overcome some of the limitations of their study.

The current study was designed with three goals in mind. First, we intended to investigate an extended mediation model of time management. In this model, we included two more time management behaviors, besides planning behavior, as independent variables. We also used a more differentiated concept of planning behavior, distinguishing between different aspects of planning and prioritizing. Secondly, we intended to investigate the unique contribution of perceived control of time in relation to a theoretically related construct, i.e. occupational self-efficacy. Thirdly, we extended Claessens et al.'s model by incorporating self, colleague, and supervisor ratings of job performance as dependent variables. We investigated whether perceived control of time and occupational self-efficacy mediated the relation between time management behaviors on the one hand and performance and well-being outcomes on the other hand, either fully or partially. As Claessens et al. (in press) found that perceived control of time partially mediated the relation between independent and dependent variables, we found it unreasonable to assume that the effects of time management behaviors on job-related outcomes would be fully mediated by perceived control of time and occupational self-efficacy and we therefore anticipated a partial mediation effect.

The extensions of the model and the focus of the current study will be discussed below. We will first discuss the independent variables, followed by the mediating variables, and will conclude with the outcome variables of our hypothesized mediation model.

Time management behaviors

In past studies, time management behaviors were suggested to consist of, among other things, planning behaviors (e.g, Macan et al., 1990; Bond & Feather, 1988; Britton & Tesser, 1991), mechanics of time management (e.g., making to do lists, Macan et al., 1990), preference for organisation (e.g., no messy workspace, Macan et al., 1990) and effective organization (e.g, having trouble organizing the things one has to do, Bond & Feather, 1988).

Previous studies found some support for a positive effect of time management on a person's perceived control of time, sales performance, study performance, and job satisfaction and a negative effect on strain, although results were modest and, with respect to performance, even contradictory (for a review, see Claessens, van Eerde, Rutte, & Roe, 2004, Chapter 2). The review of the time management literature (Claessens et al., 2004, Chapter 2)

also demonstrated that past studies were not consistent in their definition of time management and suggested a new definition of time management that covers: (1) time awareness behaviors (e.g., self-awareness of one's time use, which helps to accept tasks and responsibilities that fit within the limit of one's capabilities), (2) planning behaviors (planning and prioritizing tasks and activities), and (3) monitoring behaviors (e.g., providing a structure for managing time by an ongoing assessment of progress towards a goal and the implementation of this feedback in task execution).

In the current study, we focused on these three types of time management behaviors. First, we aimed to investigate one component of time awareness behaviors, task assessment. Task assessment refers to the scrutiny exercised by a person in the process of accepting assigned tasks. This concept is related to the difference in objective task, or 'task-as-given', and subjective task (as the worker perceives it), or 'task-as-taken', which is an important part of the theory of action regulation (e.g., Hacker, 1985; Roe, 1999). A process of accepting tasks and redefining them according to one's personal situation and capabilities is supposed to have passed before one prepares to execute tasks (cf. Hackman, 1969). More specifically, task assessment refers to the screening of new tasks and responsibilities aimed at deciding whether these tasks should be accepted or not. Those who engage in task assessment to a large extent do not (always) accept every task that they are asked to perform themselves or to take the responsibility for when performed by others. On the contrary, they only select tasks they believe they are able to perform themselves within the time available, tasks that are important parts of their work, and tasks that they cannot delegate to others. In other words, those who engage a lot in task assessment can be viewed as more aware of their time spending. Those who engage little in task assessment can be viewed as not critical; they tend to accept tasks too easily and increase the chance of overloading themselves with work, with all its consequences.

Secondly, we aimed to investigate planning behaviors in more detail than Claessens et al. (in press) did. Planning behaviors refer to behaviors aimed at planning and prioritizing tasks in order to prepare for an efficient use of time. So far, time management research did include planning behavior (e.g., short-range planning, Britton & Tesser, 1991), but did not include other aspects of planning such as anticipating unexpected events and thinking of alternative plans in case the original plans cannot be executed. However, Tripoli (1998) investigated three planning strategies in complex jobs in relation to job performance which could also be included in time management research. Using the theoretical framework of, among other things, action theory, she identified anchored planning, priority focus, and contingency planning (Tripoli, 1998) as planning strategies. Anchored planning was defined

as the extent to which the employee's planning process specifies goals, activities, and time frames. Priority focus refers to a broad integrated focus on one's work priorities when preparing to execute tasks. Contingency planning refers to the inclusion of potential events in one's planning and the consideration of alternative plans. In her study on the relation between these planning behaviors and job performance, she found that employees who focused on work priorities and engaged in contingency planning performed better than others, as rated by both peers and supervisors. Furthermore, she found that anchored planning only affected job performance in interaction with work experience. In the current study, we also included anchored planning, priority focus, and contingency planning as planning behaviors.

Third, we aimed to investigate monitoring behaviors, which consist of behaviors that provide a structure for monitoring one's time by an ongoing assessment of progress towards a goal and the implementation of this feedback in task execution. That is, people keep track of their progress in the execution of tasks (e.g., whether their work is still on schedule) and adapt their task execution accordingly, for instance by speeding up. In the current study, we focused on one aspect of monitoring behaviors, i.e. time-monitoring, which refers to the evaluation whether one's work is on schedule and if time is used in the most efficient way. Time-monitoring is related to self-regulation, although its focus is solely on monitoring oneself with respect to time. Self-regulation was defined as regulating one's behavior in relation to personal standards, goals, and environmental circumstances (e.g., Bandura, 1997; Baumeister & Vohs, 2004; Carver & Scheier, 1998). In the context of goal directed behavior, self-regulation refers to the extent to which people are motivated and able to stick to their goal and persist into action towards the goal even when they are confronted with competing motivations (Kuhl & Fuhrmann, 1998). Self-regulation has been found to be related to sales performance (Vandewalle, Brown, Cron, & Slocum, 1999). While time-monitoring is related to self-regulation, it is also different in that it focuses on feedback seeking with respect to time and the incorporation of this evaluation in people's work behavior. Time-monitoring may be positively related to job-related outcomes such as job performance.

In other words, we suggest that time management behaviors consist of being aware of time and incorporating this awareness in the assessment of tasks to be performed, planning and prioritizing tasks or activities and taking alternative plans into account, and actively monitoring oneself with respect to time in order to avoid possible discrepancies between intended and obtained outcomes.

Perceived control of time and occupational self-efficacy

Past research (e.g., Adams & Jex, 1999; Jex & Elacqua, 1999; Macan, 1994) established a relation between time management behavior and perceived control of time. Macan (1994) stated that perceived control of time was an outcome of time management behaviors. Perceived control of time refers to the feeling that one can control how time is spent. By engaging in time management behaviors, one attains a sense of being able to handle the situation with respect to time. Thus, perceived control of time was identified as an important outcome of time management behaviors.

However, as Macan (1994) suggested, this time control perception is related to one's self-efficacy perception, which also refers to a feeling of being able to handle certain situations, and can also be viewed as a control perception. Neither the similarities nor the differences between these two specific control concepts have been subjected to research so far, although it has important implications with respect to the suggested theoretical model of time management. However, within the literature on the theory of planned behavior, a conceptual distinction between self-efficacy and perceived control over behavior has been suggested. Although these concepts are not exactly the same as the concepts included in the current study, it is an illustration of the conceptual difference between two quite similar control concepts. Where in the theory of planned behavior self-efficacy refers to the belief that "behavior is easy or difficult for the individual" (Povey, Connor, Sparks, James, & Shepherd, 2000, p. 123), perceived control over behavior "reflects the extent to which the individual perceives the performance of his or her behavior to be within his or her control" (Povey, Connor, Sparks, James, & Shepherd, 2000, p. 123). Quite some empirical support was found for this theoretical distinction (for a review, see Connor & Armitage, 1998).

In parallel to the conceptual distinction within the literature on the theory of planned behavior, we argue that perceived control of time is distinguishable from self-efficacy because the first refers to the feeling that one is in charge of how time is spent at work whereas self-efficacy refers to the belief that one possesses the capabilities to handle certain situations and can rely on this belief. Because perceived control of time is a specific control perception, it would be best to compare it with a specific self-efficacy perception, such as occupational self-efficacy. Past research justified the use of specific self-efficacy measures in specific domains as it produced more robust results because a person's self-efficacy can be different depending on the activity to which it is related (Bandura 1997 in Salanova, Peiró, & Schaufeli, 2002; Gist & Mitchell, 1992). Also, general self-efficacy comes close to a personality-like construct, i.e., a general belief in one's ability to succeed, but it can also be argued that self-efficacy is a situation-specific construct, i.e., the belief in one's competence

in situations (Salanova, Peiró, & Schaufeli, 2002). Since the current study focused on the work domain, we aimed to distinguish between occupational self-efficacy and perceived control of time.

Occupational self-efficacy has been defined as one's perception of self-efficacy with respect to the requirements and job obligations of occupations (Betz & Hackett, 1981). Schyns and von Collani (2002) developed a measure of occupational self-efficacy that allowed to compare people working in different professions.

In conclusion, as we argued that perceived control of time and occupational self-efficacy are theoretically distinguishable and past studies also demonstrated a distinction between general control and self-efficacy perceptions (e.g., Armitage & Connor, 1999), we anticipated an empirical distinction between the two concepts.

Hypothesis 1. Perceived control of time and occupational self-efficacy are two empirically distinguishable control constructs.

Furthermore, in the current study we aimed to investigate the relation between time management behaviors, perceived control of time, and occupational self-efficacy. As past studies (e.g., Macan, 1994) demonstrated a positive relation between time management behavior and perceived control of time, we hypothesized that the time management behaviors included in the current study would be positively related to perceived control of time. Occupational self-efficacy has not been included in time management research so far, but as it is also a control perception, we expect a positive relation between time management behaviors and occupational self-efficacy.

Hypothesis 2. Time management behaviors (task assessment, anchored planning, priority focus, contingency planning, and time monitoring) are positively related to both perceived control of time and occupational self-efficacy.

Work-related outcomes

Our third goal was to further investigate the relation between time management behaviors, perceived control of time, and work-related outcomes such as job performance. The job performance measure used by Claessens et al. (in press) consisted of a self-rated evaluation of one's overall performance relative to the performance of others (Roe, Zinovieva, Dienes, & ten Horn, 2000). This performance rating can be viewed as a relative and possibly biased judgment of performance. Therefore, we sought a more absolute

judgment of job performance that included important dimensions of performance, such as timeliness and quality of work, in order to evaluate the working process and not just its overall outcome. Consequently, we included effectiveness of work as an additional performance measure. Where job performance was defined as the overall judgement of one's achievements relative to others (Roe et al., 2000), we define work effectiveness as a judgement of the extent to which desired results like timeliness, quality, and reliability are accomplished. As a second extension of past research, we aimed to obtain ratings of supervisors and colleagues on respondents' effectiveness and job performance. Self-ratings are biased in the sense that people tend to overestimate their performance (e.g., Fisher, 2003) whereas external ratings of performance, such as supervisor ratings can be viewed as more objective ratings.

We also aimed to investigate the relation between time management behaviors and several well-being concepts. Claessens et al. (in press) included job satisfaction and work strain in their study and found that planning behavior affected both job satisfaction and work strain indirectly, namely via perceived control of time. As an extension of this study, we included psychosomatic health complaints, besides work strain and job satisfaction. Health problems, particularly psychosomatic health complaints, are typically associated with stressors at work (e.g., Karasek, 1998). Psychosomatic health complaints refer to general health complaints that are the result of the tendency to somatize psychosocial stress conditions such as fatigue and back pain (de Jonge, 1996). As psychosomatic complaints are associated with long-term health problems (cf., Dirken, 1969) and therefore another important indication of employee well-being, we included psychosomatic health complaints in the current study.

We expected direct effects of time management behaviors on performance and well-being, following the study of Claessens et al (in press) who found that perceived control of time partially mediated the relation between planning behavior, workload, and job autonomy on the one hand and job performance, job satisfaction, and work strain on the other hand. More specifically, we expected time management behaviors in general to be positively related to one's job satisfaction and negatively to work strain and psychosomatic health complaints (c.f., Adams & Jex, 1999; Claessens et al., in press; Macan, 1994). We also expected time management behaviors to be positively related to job performance and effectiveness, because by being aware of one's time, planning in such detail and monitoring time while executing work, the outcome might be more realistic with respect to the time available to perform tasks and therefore more effectively.

Furthermore, we aimed to investigate the unique contribution of perceived control of time, in comparison to occupational self-efficacy, with respect to job performance and well-being. Following past studies, we expected perceived control of time to be positively related to job performance (e.g., Claessens et al., in press) and job satisfaction (e.g., Macan, 1994), and negatively to strain (e.g., Claessens et al., in press) and health (e.g., Nonis, Hudson, Logan, & Ford, 1998). Zapf (1993) found that work stressors (e.g. time pressure or organizational problems) were positively related to psychosomatic complaints, especially when experienced resources (control at work, control over time) were low. That is, when people do not experience control of their time at work, the negative results, stressors at work, in this case psychosomatic complaints, are stronger.

As we stated that effectiveness is another performance-indicator and a positive relation between perceived control of time and job performance has been found (Claessens et al., in press), we anticipated a positive relation between perceived control of time and job effectiveness. Although the relation between occupational self-efficacy and job performance was not part of research yet, a positive relation between general self-efficacy, job satisfaction, and job performance was established in previous research (e.g., Judge & Bono, 2001). Therefore, we expected a positive relation between occupational self-efficacy and both job performance and job satisfaction.

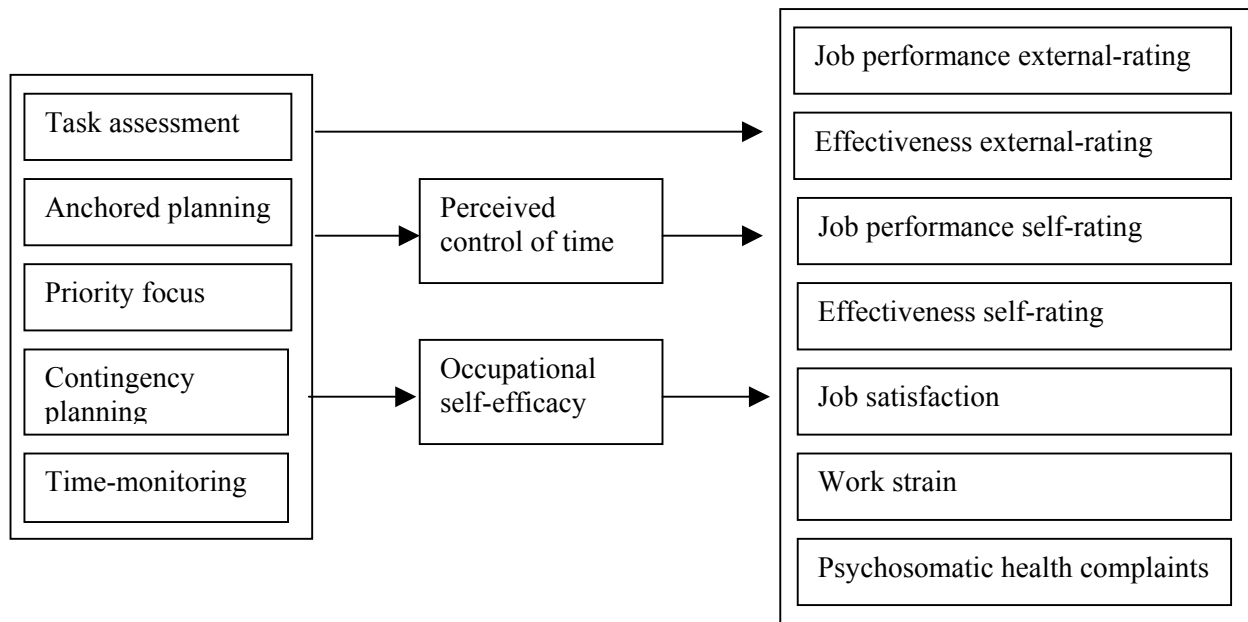
Hypothesis 3. Perceived control of time and occupational self-efficacy are positively related to job performance, effectiveness, and job satisfaction, and negatively to work strain and psychosomatic health complaints.

As stated, we hypothesized perceived control of time and occupational self-efficacy to partially mediate the relation between time management behaviors, self- and externally-rated job performance and effectiveness, and job satisfaction, work strain, and psychosomatic health complaints.

Hypothesis 4. Perceived control of time and occupational self-efficacy partially mediate the relation between time management behaviors and performance and well-being outcomes.

In Figure I, our hypothesized mediation model is presented.

Figure 1. Hypothesized mediation model: the effect of time management behaviors on outcome variables, partially mediated by perceived control of time and occupational self-efficacy.



Method

Sample and Procedure

Two hundred and four employees working in autonomous jobs in seven organizations (four service companies, three production companies) in the Netherlands were recruited to participate in a comprehensive survey study on how people manage their time at work, taking into account situational and personal factors. We asked managers or personnel officers to select people working in autonomous jobs. The group of employees consisted of consultants, project managers, account managers, sales managers, production managers, engineers, and personnel officers. Of the recruited employees, 174 employees (a 86% response rate) returned usable surveys. The sample mainly consisted of males (80%), with an average age of 40 years ($SD = 9.8$) and an average work experience of 16 years ($SD = 11.2$).

The surveys were self-administered; the instruction for completion was given on the first page of the questionnaire. All respondents voluntarily completed the questionnaire and were given company time to respond. The survey contained 14 scales, including time management behaviors, perceived control of time, occupational self-efficacy, and outcome variables.

We asked each respondent to give a shortened version of the survey they had just completed to one colleague and one supervisor who had insight into the work performance

and effectiveness of the respondents ($N = 408$). In this way, we were able to obtain external ratings of employees' effectiveness and job performance. In total, 298 usable questionnaires were returned, a response rate of 73%. Prior to designing the questionnaires, we had discussions with management and employees to ascertain that effectiveness and the other variables we measured were relevant to and present in the organization. One hundred and seventy colleagues returned questionnaires and so did 121 supervisors; 7 respondents did not identify themselves. Altogether, we obtained colleague and supervisor ratings for 117 employees, two colleague ratings for 20 employees, and single ratings for 37 employees, either by a colleague or a supervisor. Participating organizations were offered a summary of group results in exchange for their participation.

Measures

Task assessment was measured with a seven-item study-developed scale because there was no measure available. The items are included in the Appendix B. Example item: "Do you ever do the following: Tell your boss that you will give priority to other tasks than he suggested?". Ratings were made on a 5-point scale from (almost) never (1) to (almost) always (5). Cronbach's alpha for this scale was .68.

Anchored planning (Tripoli, 1998) was measured with a 13-item scale. Example item: "I usually develop timetables for most projects on which I am working". Ratings were made on a 5-point scale from do not agree at all (1) to completely agree (5). Cronbach's alpha for this scale was .88.

Priority focus (Tripoli, 1998) was measured with a six-item scale. Example item: "In my day-to-day work, it is often a struggle to keep my priorities in order". Ratings were made on a 5-point scale from do not agree at all (1) to completely agree (5). Cronbach's alpha was .78.

Contingency planning (Tripoli, 1998) was measured with a 6-item scale. Example item: "In my approach to work, I try to be adaptable to unexpected events". Ratings were made on a 5-point scale from do not agree at all (1) to completely agree (5). Cronbach's alpha was .87. As the anchored planning, priority focus, and contingency planning scales were originally in English, the scales were translated into Dutch by the first researcher. Then, the translation was checked by a sworn translator.

Time monitoring was measured with a six-item study-developed scale because no existing scale included monitoring items with respect to time. The items are presented in the Appendix B. Example item: "While executing tasks, I regularly check whether my work is still on schedule". Cronbach's alpha for this scale was .76.

Perceived control of time was measured with a six-item scale (Claessens, et al., in press). Example item: “I feel in control of my time”. Ratings were made on a 5-point scale from do not agree at all (1) to completely agree (5). Cronbach’s alpha was .77.

Occupational self-efficacy was measured with eight items (short OCCSEFF-scale, Schyns & von Collani, 2002). Example item: ‘Thanks to my resourcefulness, I know how to handle unforeseen situations in my job’. Ratings were made on a 5-point scale from completely true (1) to not at all true (5). Cronbach’s alpha was .77. As the original scale was in the English language, the scale was translated into Dutch by the first researcher. Then, the translation was checked by a sworn translator.

Job performance was measured by asking respondents to rate the performance of a person in relation to other colleagues (Roe, Zinovieva, Dienes, & ten Horn, 2000). Eight statements, for example “It has been acknowledged that my job performance is higher when compared to other colleagues” could be rated (1) no, not true to (5) yes, that is true. Cronbach’s alpha for this scale was .73. We also made the scale suitable to obtain supervisor and colleague ratings of respondents job performance, for example, “It has been acknowledged that the performance of the person I am evaluating is higher compared to other colleagues”. The correlation between supervisor and colleague scores on job performance of respondents was .46 ($p < .01$). Therefore, mean scale score of the combined supervisor and colleague ratings on job performance was calculated and used in the analyses. In the following, we will refer to the combined supervisor/colleague ratings as ‘external’ rating of performance. Cronbach’s alpha for this scale was .82.

Effectiveness was assessed with twelve items that were especially developed for this study. Items were derived from relevant literature and tested in preliminary interviews with 17 employees of seven organizations working in autonomous jobs. These pilot employees were not included in the main survey sample. The items referred to the timeliness, quality of work, and reliability in meeting one’s commitments and are presented in the Appendix B. Example item: Usually, I am able to perform many things in little time. Ratings were made on a 5-point scale from do not agree at all (1) to completely agree (5). Cronbach’s alpha for this scale was .77. The scale was also used in an adapted version in order to obtain supervisor/colleague ratings of respondents’ effectiveness. Example item: “Usually, the person I am evaluating is able to perform many things in little time”. The correlation between supervisor and colleague scores on effectiveness of respondents was .57 ($p < .01$). Therefore, a mean scale score of the combined supervisor and colleague ratings on effectiveness was calculated and was used in the analyses. In the following, we will refer to the combined

supervisor/colleague ratings as 'external' rating of effectiveness. Cronbach's alpha for this scale was .85.

Job satisfaction was measured with the Kunin (1998) faces measure, with five different faces to choose from, ranging from a very unhappy to a very happy face. The higher the score, the higher the job satisfaction.

Work strain was assessed with a 12-item scale (Roe & Zijlstra, 2000) and indicated people's dealing with strain in their job caused by time pressure. Participants responded to each item using a 5-point scale from do not agree at all (1) to completely agree (5). Example item: "I find it hard to relax at the end of a workday". Cronbach's alpha was .89.

Psychosomatic health complaints were measured with a shortened version of the Subjective Health Questionnaire (VOEG), which contained seven items. The VOEG was identified as an adequate measure of individual subjective health status (c.f., Dirken, 1969, Joosten & Drop, 1987, Visser, 1983). Example item: "Were you troubled by headaches, during the last six months?". Participants responded to each item by indicating "no" (0) or "yes" (1). The scale scores consisted of the summated number of psychosomatic health complaints.

Data Analysis

The data contained very few missing scores on the 14 variables included in the analyses. On the self-report questionnaires, only 5 scores were missing on a total of 174 cases, which is less than three percent. On the supervisor/colleagues questionnaires, 14 scores were missing on a total of 174 cases, which is eight percent. The missing scores were imputed by means of the regression imputation procedure in SPSS 11.5 with a randomly chosen regression residual added to the expected value of each missing score. This procedure is a commonly used method when there are few missing data scores (Little & Rubin, 2002). We used three types of analysis: principal component analysis, confirmatory factor analysis, and structural equation modeling using AMOS software (Arbuckle & Wothke, 1999).

The scales developed in this study (task assessment, self-monitoring, and effectiveness) were factor analyzed by means of principal component analysis.

Confirmatory factor analysis was applied to test the discriminant validity of the perceived control of time versus the occupational self-efficacy scale. To test whether the two-factor solution fitted the data, the root mean square error of approximation (RMSEA, Brown & Cudeck, 1993), the comparative fit index (CFI, Bentler, 1990), the goodness-of-fit index (GFI, Jöreskog & Sörbom, 1993) were inspected. Browne and Cudeck (1993) maintained that RMSEA-values below .05 show a good fit, and values between .05 and .08 are acceptable. It

is customary to regard CFI values higher than .90 as indicative for a good fit (Bentler, 1989), although others recently argued that only CFI values of .95 and above can be considered to indicate good fit (Hu & Bentler, 1999). We also present RMR values, which should be .06 or lower (e.g., Anderson and Narus 1990).

The mediation model was tested with structural equation modeling. The model consisted of three blocks of variables: the independent variables (time management behaviors), the mediating variables (perceived control of time and occupational self-efficacy), and dependent variables (e.g., job performance). In a pure mediational model, the independent variables are assumed to only have direct effects on the mediating variables, which in turn have direct effects on the dependent variables. In a less restrictive mediation model, the independent variables may also have direct effects on the dependent variables. Since we included variables to measure time management behaviors and effectiveness which were not previously investigated, we could not fully specify the fine structure of the path model. Therefore, we started with a saturated model that included all possible paths between variables that respected the causal order from independent to mediating to dependent variables. Moreover, all error terms within each block of variables were correlated since we could not assume that all of the covariance between two variables within each block could be explained perfectly by the causally prior variables. A zero correlation between those error terms would imply that the partial correlation between the two independent variables completely vanishes when we control for the independent variables. This will only be the case if the model is causally closed in the sense that no relevant independent variables are omitted from the analysis. A saturated model fits the data perfectly. In search for a parsimonious model, a backward elimination procedure (also referred to as theory trimming method, McPherson, 1976) was followed. This procedure has been shown to be superior to forward or stepwise procedures (e.g., Mantel, 1970). The backward elimination procedure consisted of a systematic removal of non-significant path coefficients from the model. Each time one non-significant path coefficient was set equal to zero, the value of the modification indices were inspected to check whether a path coefficient that was removed earlier in the elimination

Table 1. Descriptive Statistics and Intercorrelations among Study Variables (N=174)

Variable	Range	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Task assessment	1-5	3.78	.52	-													
2. Anchored planning	1-5	3.36	.53	-.04	-												
3. Priority focus	1-5	3.13	.40	-.13	.42**	-											
4. Contingency planning	1-5	3.53	.48	.03	.34**	.27**	-										
5. Time-monitoring	1-5	3.49	.51	-.15*	.49**	.30**	.11	-									
6. Perceived control of time	1-5	3.67	.59	.07	.25**	-.13	.13	.19*	-								
7. Occupational self-efficacy	1-5	3.88	.48	.02	.42**	.03	.38**	.12	.55**	-							
8. Job satisfaction	1-5	4.13	.79	.10	.22**	-.01	.17*	.02	.52**	.50**	-						
9. Work strain	1-5	2.48	.59	-.20**	-.08	.27**	-.03	.02	-.65**	-.50**	-.52**	-					
10 Psychosomatic complaints	0-7	1.31	1.58	-.11	-.16*	.03	-.18*	-.04	-.38**	-.32**	-.45**	.55**	-				
11. Effectiveness (self)	1-5	3.80	.39	.20**	.29*	-.04	.10	.15*	.50**	.41**	.36**	-.37**	-.14	-			
12. Job performance (self)	1-5	3.59	.61	-.02	.28*	.05	.26**	.11	.42**	.58**	.38**	-.27**	-.22**	.46**	-		
13. Effectiveness (external)	1-5	3.78	.48	-.07	.04	-.06	-.03	.02	.26*	.10	.21**	-.13	.01	.30**	.24**	-	
14. Job Performance (external)	1-5	3.55	.71	-.21*	.13	.00	.07	.04	.35*	.25**	.28**	-.16	-.10	.19*	.43**	.61**	-

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

procedure should be included again in the model or not. A further simplification of the model was obtained by removing the non-significant error terms from the model. The final model consisted of significant path coefficients and significant error terms. The extent to which the final model fitted the data was again expressed in the RMSEA, CFI, GFI, and RMR scores.

Results

Descriptive Statistics

Descriptive statistics, frequencies, and intercorrelations among the time management behaviors, perceived control of time, occupational self-efficacy, and outcome variables are presented in Table 1.

We conducted principal component analyses on the items of the three study-developed scales in this study, namely task assessment, time-monitoring, and effectiveness. Results showed that the items of each scale loaded on one factor, indicating acceptable scales. Factor loadings of the task assessment items ranged from .46 to .72 and explained 39% of the common variance. For time-monitoring, factor loadings ranged from .55 to .74 and explained 46% of the common variance. Factor loadings of the effectiveness items on one scale ranged from .28 to .73, explaining 33% of the common variance.

Perceived control of time versus occupational self-efficacy

Confirmatory factor analysis was conducted to investigate the discriminant validity of perceived control of time and occupational self-efficacy. The fit measures for a one- versus two-factor model are presented in Table 2.

Table 2. *Fit measures for the test of the discriminant validity of a two-factor model of perceived control of time and occupational self-efficacy compared to a one-factor model (N=174)*

Model	Chi-square	df	P	RMSEA	AIC	CFI	RMR
One-factor	213.00	65	0.00	0.12	265.00	.83	.05
Two-factor	87.20	60	0.00	0.05	149.20	.97	.03
Difference	125.80	5	0.00				

The two-factor model, where the perceived control of time items loaded on the first factor and the occupational self-efficacy items loaded on the second factor yielded a significant better fit than the one-factor model (delta chi-square = 125.80, df = 5, $p < .00$,

RMSEA = .05, AIC = 149.20, CFI = .97, RMR = .03). Although results were satisfactory, the two-factor model did not fit the data perfectly, because two occupational self-efficacy items appeared to load on a third factor. The results of the two-factor model were sufficient for the purpose of demonstrating the superior fit of a two-factor model compared to a one-factor model, thus confirming *H1*.

Mediation model

Our mediation model consisted of time management behaviors (task assessment, anchored planning, priority focus, contingency planning, and time-monitoring) as independent variables, perceived control of time and occupational self-efficacy as mediators, and job performance, effectiveness, job satisfaction, work strain, and psychosomatic health complaints as dependent variables. Hypothesis 2 and 3 were tested by means of structural equation modeling based on the path model shown in Figure 1. Whether a particular relation between two variables referred to in our hypotheses was positive or not was tested by means of a one-sided significance test for the corresponding regression coefficient in the relevant regression equation. In this way, we tested whether the independent variable had a significant positive or negative *direct* effect on the dependent variable. The same path analysis provided a test of Hypothesis 4. A particular intervening variable in the second block mediates between variables in the first and the third block if the first block variable has a significant direct effect on the second block variable, and the second block variable itself has a significant direct effect on the third block variable. If both these direct effects are significant, the first block variable has a significant *indirect effect* on the third block variable.

Results showed that only anchored planning and time-monitoring were positively related to perceived control of time, and only anchored planning and contingency planning were positively related to occupational self-efficacy. Contrary to our expectations, priority focus was negatively related to both perceived control of time and occupational self-efficacy, and task assessment was not significantly related to both constructs. Thus, *H2*, time management behaviors are positively related to both perceived control of time and occupational self-efficacy, was only partially supported.

As for the mediation model, results showed that perceived control of time and occupational self-efficacy indeed partially mediated the relation between time management and the outcomes ($\chi^2 = 43.71$, $df = 49$, $p < 0.01$, RMSEA = .000, CFI = 1.00, GFI = .97, RMR = .02), thus confirming *H3*. The direct and indirect relations were tested all at once, but for the purpose of presentation we choose to present the results in two steps. The *indirect* relations between the time management behaviors on the outcome variables are depicted in

Figure 2a and the *direct* relations between the time management behavior and outcome variables are depicted in Figure 2b, although the two cannot be read independently.

Perceived control of time was significantly related to all outcome variables as predicted, whereas occupational self-efficacy was only significantly related to the external rating of effectiveness, the self-rated job performance, and the well-being variables. Both constructs were positively related to job performance (self-rating) and job satisfaction, and negatively related to work strain and psychosomatic health complaints.

Also, the strengths of the relations between perceived control of time, occupational self-efficacy and outcome variables were different for each construct. As can be seen in Figure 2a, perceived control of time was a stronger predictor than occupational self-efficacy for all well-being variables (job satisfaction, work strain, and psychosomatic health complaints) and for the external rating of effectiveness. Occupational self-efficacy was a stronger predictor for the self-ratings of job performance. Only perceived control of time was significantly related to the effectiveness ratings (self-rating and external rating). Perceived control of time was positively related ($\beta = .36$) to the external rating of effectiveness, whereas occupational self-efficacy was surprisingly negatively related ($\beta = -.15$).

As for the direct effects of time management behaviors on performance and well-being, depicted in Figure 2b, the results were rather modest. Task assessment was positively related to the self-rated effectiveness ($\beta = .21$) and negatively to work strain ($\beta = -.11$) and, surprisingly, negatively to external rating of job performance ($\beta = -.17$). Anchored planning was positively related to the self-rated effectiveness ($\beta = .18$). Priority focus and contingency planning were positively related to work strain ($\beta = .17$ and $\beta = .12$, respectively).

Figure 2a. Mediation model: the *indirect* effect of time management behaviors on outcome variables (partially mediated by perceived control of time and occupational self-efficacy).

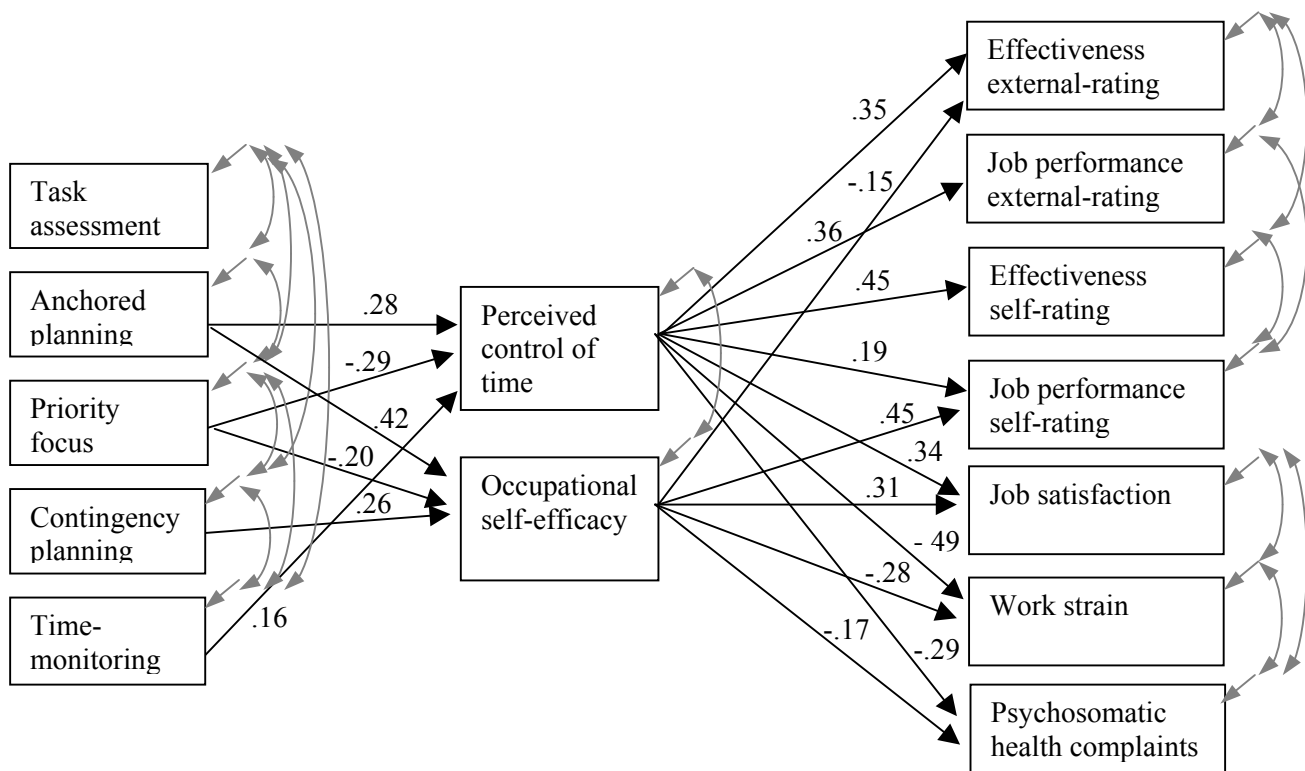
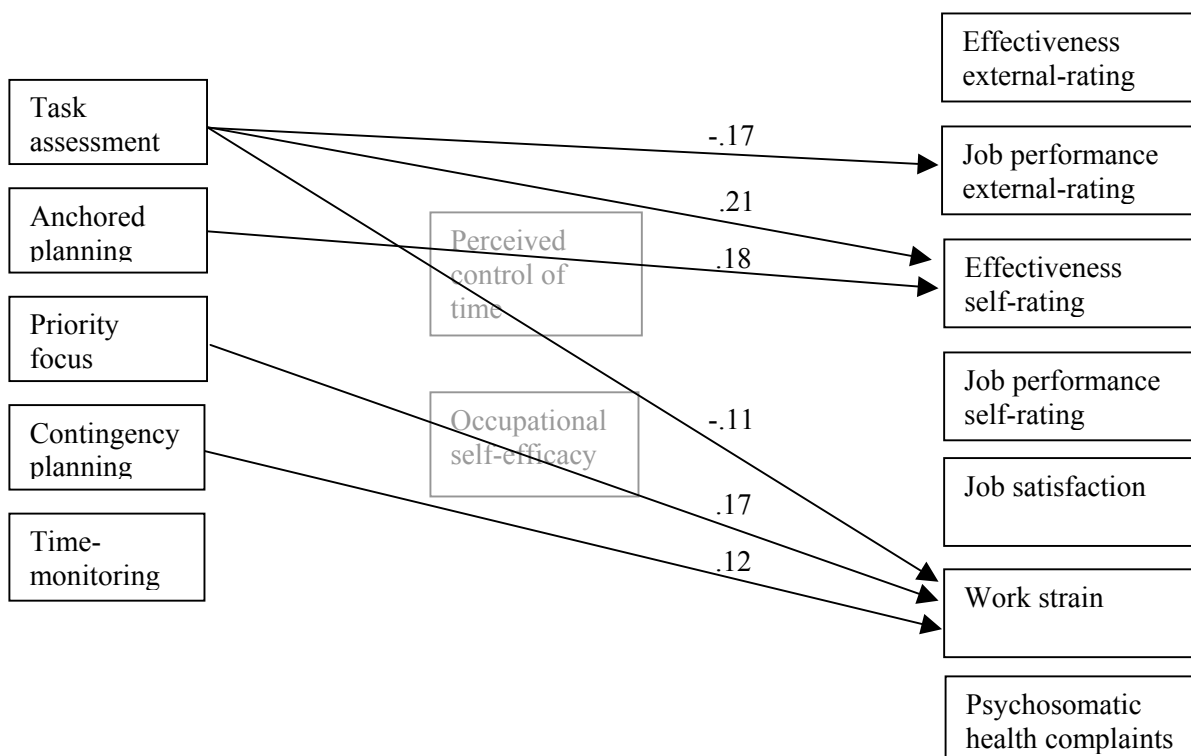


Figure 2b. Mediation model: the *direct* effect of time management behaviors on outcome variables.



Conclusion and Discussion

We had a number of objectives for the current study. First, we aimed to investigate an extended time management mediation model based on the study of Claessens et al. (in press). We have added to research in three ways, by including several time management behaviors (planning behaviors, task assessment behavior, and time-monitoring behavior) as independent variables, by incorporating occupational self-efficacy as a second mediating variable, and by including several performance (both self- and external ratings) and well-being outcomes. We expected perceived control of time and occupational self-efficacy to partially mediate the relation between time management behaviors and performance and well-being outcomes. Additionally, we hypothesized time management behaviors to be directly related to performance and well-being outcomes of work.

Results showed that perceived control of time and occupational self-efficacy indeed partially mediated the relation between several time management behaviors and outcomes which confirmed part of our hypotheses, but we also found some relations that were different than we had anticipated.

As for the relation between time management behaviors, perceived control of time and occupational self-efficacy, the results differed from what we expected. We hypothesized time management behaviors to be positively related to both concepts. Results showed that only anchored planning was a significant and positive predictor of both perceived control of time and occupational self-efficacy. Thus, it seems as if planning into some detail increases the perception of control of time and the perceived ability to perform one's work. Contrary to our expectations, contingency planning was only significantly related to occupational self-efficacy and not to perceived control of time. Thus, the anticipation of obstacles in the execution of plans and the consideration of alternative plans seems to enhance the perceived ability to perform tasks, but does not affect the control perception. As Tripoli (1998) stated, contingency planning reduces the dependence of a person on only one plan and thus, a person can switch to another plan when necessary. Since this bears reference to the actual execution of work (pro-activeness), it is more likely that it affects the perception of abilities to perform work instead of the perception that time is under one's control. Tripoli (1998) also suggested another explanation. As she noticed that contingency planning was included in the operationalization of the 'planfulness' concept (Frese, Stewart, & Hannover, 1987 in Tripoli, 1998), contingency planning could be related to one's personality and therefore affect self-efficacy perceptions. Time monitoring was only significantly and positively related to perceived control of time, but not to occupational self-efficacy. Thus, monitoring time when

passing increases the feeling that one can control time but is not related to the belief that one is capable to perform certain tasks.

As for the direct relations between the time management behaviors and performance and well-being outcomes, the results were rather modest. Task assessment was positively related to the self-rated effectiveness and negatively to work strain and, surprisingly, negatively to external rating of job performance.

Anchored planning was positively related to the self-rated effectiveness. Thus, planning tasks and activities to be performed in some detail was found to be positively related to an effective work outcome. This finding seems logical as planning implies that one takes the available time as a starting point when deciding which tasks to perform. Tripoli (1998) found little support for a direct relation between anchored planning and performance, but instead found an interaction between anchored planning and work experience in relation to performance. She found that employees with moderate levels of work experience took more advantage from engaging in anchored planning than others. Priority focus and contingency planning were positively related to work strain, but we also found contingency planning to be positively related to occupational self-efficacy, which in turn was negatively related to work strain. There might be a pay-off relation, a certain level of contingency planning is effective, whereas when people focus too much on possible obstacles and alternative plans when preparing for action, they might worry and feel frustrated about what might come in their way. Whereas engaging in contingency planning is perhaps suitable for some, for instance those who prefer to foresee possible obstructions in the execution of tasks, engaging in anchored planning and thus specifying goals, work activities with respect to the time available, seems suitable for most people.

Thus, the different time management behaviors were differently related to job-related outcomes. Task assessment and anchored planning were most positive in terms of their relation to job effectiveness, whereas priority focus and contingency planning were most negative as they were associated with higher work strain. Time monitoring only had an indirect effect on the outcomes, that is, through perceived control of time. It was not significantly directly related to either job performance or well-being.

Results showed that the time management behaviors included in the current study were related to one another, but the correlations between behaviors were not high enough to interpret them as operationalizations of one single time management concept. Past research (e.g., Bond & Feather, 1988; Macan et al., 1990) already suggested that the time management concept was multidimensional. Future research could focus on the multidimensionality of the current operationalisation of time management behaviors. As task assessment behavior only

had direct effects on the outcome variables, it might be a quite different time management behavior than the other time management behaviors. A possible explanation is that task assessment behavior refers to a different process: the transition of imposed objective tasks to accepted subjective tasks (cf. Hacker, 1985). The outcome of this selection process has two extremes, i.e., one could accept tasks too easily, which increases the chance of role overload and could lead to problems in planning and executing tasks, or one could keep off tasks too easily and avoid task execution. These extremes are reflected in the relation between task assessment and outcomes as we found that task assessment behavior was positively related to self-rated effectiveness on the one hand and negatively related to externally-rated job performance on the other hand. This is not surprising since a critical reserved attitude in the acceptance of tasks may imply that people view themselves as working effectively where others are maybe disappointed that they will not perform (part of) the requested tasks. Thus, as past studies also suggested, it seems justifiable to treat time management behavior as a multidimensional construct that triggers different psychological processes as we found it was differentially related to both the mediators and the job-related outcomes. These processes can be studied in more detail in follow-up studies.

A second objective of the current study was to extend research on the suggested mediator, perceived control of time, by investigating its unique contribution in comparison to a theoretically related construct: occupational self-efficacy, in relation to both time management behaviors and job-related outcomes. We hypothesized perceived control of time and occupational self-efficacy to be two distinguishable control concepts, and that time management behaviors would be positively related to both perceived control of time and occupational self-efficacy. We also hypothesized perceived control of time and occupational self-efficacy to be positively related to performance and well-being measures. Our results supported our expected distinction between perceived control of time and occupational self-efficacy as we found that a two-factor solution fitted our data significantly better than a one-factor solution. Additionally, the fact that a three-factor solution would fit our data even better, pointed at a weakness of the occupational self-efficacy scales, two items of which did not strongly correlate with the remainder of the items. This finding is not in line with previous research that demonstrated a one-dimensional occupational self-efficacy construct (Schyns & von Collani, 2002). Although the translation was checked by a sworn translator, there may still be differentiation in connotation. In other words, people might have different understandings of the same words and as a result perceive it as different dimensions of occupational self-efficacy.

Results for the relations between perceived control of time and occupational self-efficacy and outcome variables showed that they were partly in the same direction, but perceived control of time was related to all outcome variables and occupational self-efficacy was not. Perceived control of time was the strongest predictor for all outcome variables but the self-rating of performance and psychosomatic complaints, when compared to occupational self-efficacy. In line with past studies, we found that perceived control of time was positively related to job satisfaction and negatively to work strain and psychosomatic complaints (e.g., Adams & Jex, 1999; Macan, 1994). Also, we found perceived control of time to be positively related to self-rated performance outcomes, which is in line with the study of Claessens et al. (in press), but also positively to externally-rated job performance and effectiveness. Occupational self-efficacy was only significantly related to externally-rated effectiveness, and to self-reported job performance and all well-being outcomes. Surprisingly, occupational self-efficacy was found to be negatively related to externally-rated effectiveness. Why occupational self-efficacy was found to relate to self-reported job performance but not to externally-rated job performance needs to be studied in more detail in future studies. We found only one study that investigated the relation between occupational self-efficacy and academic performance and found that occupational self-efficacy did not significantly predict academic performance. However, as past studies did establish a positive relationship between general self-efficacy and self- and external ratings of job performance (see Judge & Bono, 2001 for a meta-analysis), we also expected to find a positive and significant relation between occupational self-efficacy and both self-rated and externally-rated performance. One explanation is perhaps that people with high self-rated occupational self-efficacy are viewed as highly self-confident and may come across as having a careless or arrogant attitude towards task performance, which leads to a negative rating of a person's effectiveness. Another explanation is that people perhaps tend to overestimate their occupational self-efficacy and that this view is not shared by supervisors and colleagues.

Thus, perceived control of time and occupational self-efficacy were found to be both theoretically and empirically distinguishable and differentially related to performance and well-being outcomes which suggests that they may serve complementary roles rather than competing roles. This finding is in line with the conceptual and empirical distinction between two similar control constructs within the theory of planned behavior. Perceived control of time appeared to be a better predictor for most of the outcome variables in comparison to occupational self-efficacy and can therefore be viewed as an important construct, which is in line with the study of Claessens et al. (in press). On the other hand, as we found that occupational self-efficacy was significantly related to some of the time management

behaviors on the one hand and job-related outcomes on the other hand, our extension of Claessens et al. proved useful. As there were still direct relations between some of the time management behaviors and job-related outcomes, there might be additional construct mediating between time management behaviors and job-related outcomes.

A third objective was the use of additional performance measures. The effectiveness measure proved to be valuable as it gave more information on the performance outcomes of both perceived control of time and self-efficacy. Especially as we found that occupational self-efficacy was positively related to self-rated performance (but not to externally-rated performance) yet negatively related to externally-rated effectiveness. In the current study, we included supervisor and colleague ratings of performance and effectiveness besides self-ratings. As the supervisor and colleague ratings correlated quite highly, we combined them in an external rating of performance and effectiveness. As in most studies of external performance ratings, we found a relatively low correlation between the self-ratings and external ratings. A possible explanation for this finding is that the nuances in one's performance and effectiveness at work is private to some extent and difficult for another person to estimate. It should be noted that the size of the correlation is in the upper range of peer-subject correlations in other studies (Frese, Stewart, & Hannover, 1987, p. 1186).

In terms of performance-effective time management strategies, anchored planning, contingency planning, and time monitoring may be recommended. Engaging in anchored planning and time monitoring was found to positively relate to perceived control of time, which in turn positively affected performance and well-being. Also, engaging in anchored planning and contingency planning was found to be positively related to occupational self-efficacy, which in turn positively affected self-rated job performance and well-being. Thus, in order to increase one's job performance, effectiveness, and job satisfaction and to decrease work strain and psychosomatic health complaints, engaging in anchored planning, contingency planning, and time-monitoring may be helpful. Focusing on one's priorities seems to be a less effective time management strategy because it is negatively related to both perceived control of time and occupational self-efficacy, but also because it is positively related to work strain. Thus, it appears that focusing too much on one's work priorities has negative consequences. When there are many work interruptions in the work situation on a regular basis, focusing on one's priorities might be conflicting with the actual situation because one has to continually assess the importance of the tasks that come along and as a consequence may find it difficult to decide on the priority order of activities. In other words, it might be difficult to maintain one's priorities because it implies less flexibility in adapting to unexpected events, which can increase strain. In actual work situations, it may be more

effective to perform a lower priority task first, for instance a highly urgent, yet unimportant task, because it might satisfy customers or colleagues that depend on the outcome of this task, or because it might otherwise interrupt the performance of other activities. On the other hand, as Tripoli (1998) suggested, one has to keep priorities in mind in order to work efficiently, so some level of priority focus is needed.

Limitations of the current study were first the cross-sectional nature of the data, which implies that the causality of the relations can be disputed, and secondly the use of new, and thus not validated, scales to measure two time management behaviors (time assessment behavior and time monitoring behavior) and the performance-outcome effectiveness. Strong features of the current study, however, were that data were collected in seven organizations, which increases the heterogeneity of the sample, and the fact that we gathered supervisor and colleague ratings of performance.

Another limitation may be the use of the backward elimination procedure in finding a parsimonious model. Although this method of analysis is commonly accepted, it does not rule out the option of chance capitalization with respect to the outcomes. Therefore, replication studies are needed to confirm the model and relations between concepts as found in this study.

Future research should focus on the validation of the time management and effectiveness measures. Also, research could focus on investigating other antecedents of perceived control of time, such as the role of job and personal characteristics. The study of Claessens et al. (in press) demonstrated the importance of workload and job autonomy. Other concepts, such as work interruptions, task complexity, leadership styles, but also personality variables such as conscientiousness and procrastination, could be included in future research in order to establish the importance of time management behaviors at work.

In summary, the current study found support for a new time management model in which perceived control of time partially mediates the relation between time management behaviors on the one hand and performance and well-being outcomes on the other hand. Additionally, the current study demonstrated that perceived control of time is an important concept because it still had an effect on all performance and well-being outcomes when a theoretically related construct, namely occupational self-efficacy, was entered into the mediation model.

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Individual Pacing styles in Relation to Time Management Behaviors at Work*

This study explored the relation between individual pacing styles, the distribution of one's activity on tasks over time, and concepts of a theoretical model of time management. These concepts included time management behaviors, perceived control of time, occupational self-efficacy, and self- and externally-rated job performance and effectiveness. Additionally, the relationship with working overtime was investigated. Results showed that respondents were relatively equally divided over the different pacing styles and differed in planning behavior, perceived control of time, occupational self-efficacy, working overtime, and self- and externally rated performance and effectiveness.

* This chapter is based on: Claessens, B.J.C., Rutte, C.G., van Eerde, W., & Roe, R.A. Individual Pacing Styles in Relation to Time Management Behaviors at Work. Manuscript in preparation.

Time management was introduced several decades ago as an efficient work strategy that would be suitable for all employees (e.g., Lakein, 1973). However, as was suggested by Shahani, Weiner, & Streit (1993), individuals differ in their general approach to work, and in their time management behavior in particular. As a consequence, they may have different needs for time management techniques. So far, little research has been done on individual differences with respect to time management behaviors at work (for a review, see Claessens, van Eerde, Rutte, & Roe, 2004, Chapter 2). The studies that were conducted focused on the relationship between several personality variables (e.g., Type A behavior, Bond & Feather, 1988), and time management training (Orpen, 1994) in relation to time management behavior. Results showed some support for a dispositional basis of time management behavior and some support was found for the positive effect of time management training in enhancing time management skills. However, the question how people differ in their approach to the temporal aspects of work and how these differences relate to time management behaviors still remains.

In practice, a much observed phenomenon is that people only start working on tasks when the deadline is near. The tendency to postpone their tasks until the last moment, may have a number of reasons. One reason is that people want to feel the pressure of the deadline, as they believe that they are better able to perform under a certain level of stress. For example, Seers & Woodruff (1997) demonstrated, in a sample of 50 students working in group projects, that when groups started feeling time pressured, they increased their work activities. They found that groups spent most time working on the projects and made most progress starting from halfway the allotted time period. Another reason can be found in the procrastination literature. People who tend to procrastinate will start working on tasks only when the deadline is near (Van Eerde, 2003) because they put off tasks until the last moment as an avoidance reaction to the stress placed by the deadline (Carver, 1996) or because they perceive the tasks as unattractive (i.e., difficult, uninteresting) and therefore avoid to perform these tasks (van Eerde, 2000). Other people prefer not to wait until the last moment to perform their tasks; moreover, they start working on tasks as soon as possible and aim to complete these tasks long before the deadline is due. One could think of several reasons why they prefer this style. People who tend to start early may be more committed to their work, they may use their first creative moments to execute and complete most of their tasks, or they foresee obstacles (e.g., work interruptions) in the execution of their tasks that they want to prevent by doing most of the work as soon as they can.

Some studies on deadlines, for instance Waller, Conte, Gibson, & Carpenter (2001), have proposed that individual perceptions of deadlines of team members relate to their

personal characteristics (i.e., time urgency, time perspective), and affect team performance. As a result of these differences, teams have problems in coordinating actions needed to perform tasks and in completing the work when it is needed (before the deadline), resulting in lower team performance. Blount & Janicik (2002) pointed at the different preferences people have for spreading out tasks or activities over time and the pace in which they perform their tasks, especially with respect to deadlines. Lim & Murnighan's (1994) investigated temporal activities of bargaining pairs with respect to deadlines and suggested four styles of temporal action. They suggested a constant action model, a constantly increasing action model, a deadline model, in which there is constant action up to the deadline and an enormous increase in action when the deadline is due, and a two phase model (adapted from Gersick, 1989 in Lim & Munigham, 1994), in which there is constant action until halfway the deadline period and action than immediately increased to a higher constant level. Their study showed that most bargaining pairs exhibited constant action or constantly increasing action.

Gevers, Rutte, & van Eerde (2004) studied peoples' individual styles with respect to deadlines into further detail. They developed a scale measuring pacing styles, that ranged from starting to work on new tasks immediately to waiting until the deadline is near before they start to work on the tasks. These styles reflect the relative amount of activity people show when they start working on tasks, halfway the deadline, and when the deadline is due, expressed as an ordinal measure. The first style represents those who tend to start early and finish long before the deadline is due. The fifth style represents those who do most of the work shortly before the deadline. The intermediate styles are two moderate tendencies towards the early and late starting style and a constant style (spreading action evenly over time). Gevers et al. (2004) found that the similarity in pacing styles of group members was positively related to shared temporal cognitions, which signifies that the more the group members were alike in their personal pacing styles, the higher their shared temporal cognitions were. When group members, on average, had an 'early action' pacing style, shared temporal cognitions helped group members to complete their tasks within the deadline. Furthermore, they demonstrated that the individual pacing styles were significantly correlated to conscientiousness ($r = -.44, p < .001$), which implies that so-called 'deadline action workers' had lower conscientiousness scores than the so-called 'early action workers'.

Gevers et al. (2004) suggested that there might be two additional styles to their suggested pacing styles. Some individuals preferred most activity at the start of a new task and at when the deadline is near (U-shape model), indicated that they started to work on new tasks and let it rest for some time to finish up later on. Other individuals may tend to do most of the work somewhere halfway the time before the deadline (inverted U model); they may

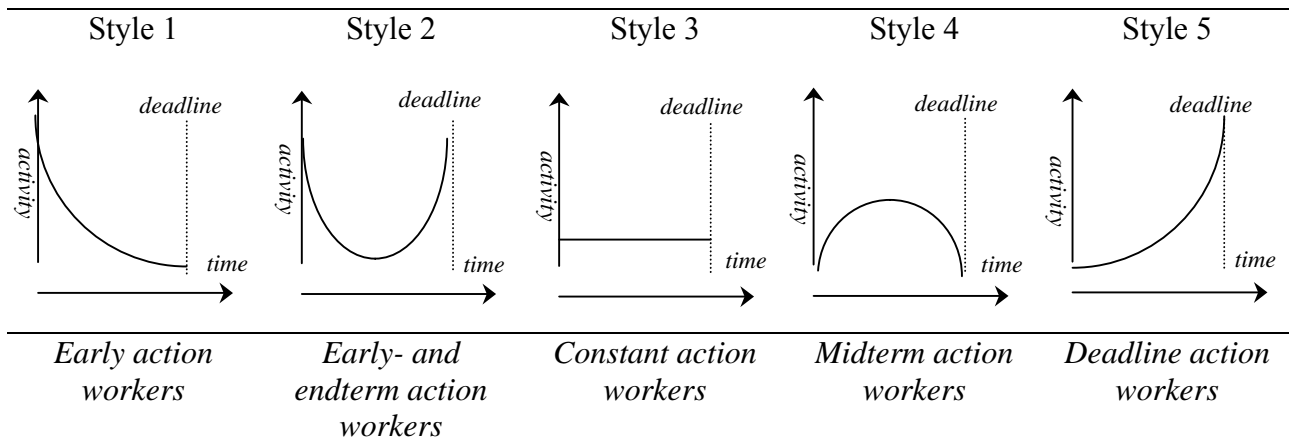
feel that this would help them to be most precise and creative as they had time to think things over.

The goal of the current study was to explore the effect of individual pacing styles in relation to time management behaviors. More specifically, pacing style implies the moment when to start working on tasks, that is, early or late with respect to the deadline and the persistence in the level of activity. We investigated these styles in relation to time management behavior and performance within the theoretical model of time management suggested by Claessens, Rutte, van Eerde, & Roe (2004, Chapter 5).

In this model of time management, time management behaviors were hypothesized to affect job-related outcomes both directly and indirectly, namely via perceived control of time and occupational self-efficacy. It was demonstrated that some time management behaviors were related to perceived control of time and occupational self-efficacy, which in turn, affected job performance and personal well-being at work positively, over and above a direct effect of time management behaviors on these job-related outcomes. Time management behaviors included in their model were task assessment behavior, planning behaviors, and time-monitoring behavior. Task assessment behavior refers to the assessment of new tasks in order to determine whether these tasks should be accepted and performed by oneself or not. Those who engage in task assessment select tasks that they believe that they are able to perform themselves within the time available or tasks that are important parts of their work, or tasks that they cannot delegate to others. Claessens et al. (2004, Chapter 5) included three planning behaviors, i.e., anchored planning, priority focus, and contingency planning, adapted from Tripoli (1998). Anchored planning was defined as the detailedness of planning goals, activities, and time frames. Priority focus refers to the focus on one's work priorities when deciding which tasks to perform. Contingency planning refers to the inclusion of potential obstacles during the execution of tasks while planning and the development of alternative plans. Finally, included time-monitoring, which refers to the constant personal evaluation of one's working process in order to determine whether the work is on schedule and time is used in the most efficient way. They included job performance, defined as the overall judgement of ones' achievements relative to others (Roe et al., 2000), and work effectiveness, a judgement of the extent to which desired results like timeliness, quality, and reliability are accomplished (Claessens et al, 2004; Chapter 5). As stated, the way people cope with time may be an important individual difference with respect to time management and its effects. Taking the study of Gevers et al. as a point of departure, we aimed to investigate different pacing styles in relation to time management behaviors, perceived control of time, and performance outcomes.

We focused on three of Gevers et al. (2004) personal pacing styles, namely ‘early action workers’, ‘constant action workers’, and ‘deadline action workers’. We added two other styles, namely ‘early- and end-term workers’ and ‘midterm workers’. The styles are depicted in Figure 1.

Figure 1. Individual pacing styles.



In general, we expected people with certain pacing styles to differ with respect to their engagement in time management behaviors, their perceived control of time, and their job performance and effectiveness ratings. We also investigated whether or not they worked overtime, as this might be a compensating strategy to complete their work within time.

The pacing styles represent the distribution of people’s activity over time. In other words, it reflects when they start being active and whether their level of activity is constant over time. As there are no previous studies on the relationship between these styles and the concepts of the time management model, we can only speculate about these relationships.

With respect to early action workers (Style 1), Gevers et al. (2004) found that they were highly conscientious. Therefore, we expected them to be more committed to their work and to pursue high performance. We hypothesized the early action workers to engage strongly in time management behaviors as they might be highly motivated to do whatever they can to finish their tasks in time. As a result of their engagement in time management behaviors and because they complete most of the work long before the deadline is due, they are likely to experience relatively high perceived control of time and relatively high occupational self-efficacy, and to perform relatively well and work effectively. We expected them to work least overtime, as they finish long before the deadline is due.

Second, we viewed the early- and end term workers (Style 2) as people who start working on new tasks with much activity, decrease activity towards the midterm, and pick up the work towards the deadline. We expected them to engage in time management behavior only to some extent. They might consciously plan to work hard at start, than take rest, and with renewed energy finish up the work. On the other hand, this pacing style might also be found with people who get frustrated after the first efforts or who get interrupted and consequently need to work hard towards the deadline. We find the second explanation more plausible. In this regard, this style has similarities with Style 5, the deadline action workers. However, as they are active in the beginning, we do not consider their behavior as procrastinating. As their engagement in time management behaviors can be moderate, we anticipated them to experience a moderate level of perceived control of time. Also, as they may get distracted or frustrated, they might perceive less control over time and less occupational self-efficacy, and have moderate job performance and effectiveness. As they are still active when the deadline is near and may have to do some more work to complete their tasks, they might work overtime to finish on time.

Third, the constant action workers were expected to engage highly in time management behaviors. Working constantly may imply that one is less distracted in the execution of tasks, monitors whether the work is still on time, and plan when to work on the tasks. As a result of their engagement in time management behaviors, we anticipated workers with this style to perceive time to be under their control, and to experience occupational self-efficacy. As a result, they are likely to perform highly, work effectively, and work little overtime.

Fourth, we propose that the midterm action workers prepare to do most of the work halfway the deadline, as they may not want to start immediately due to a number of reasons. For instance, they may want to be open to changes in task demands or think things over before they start executing their tasks. When they feel prepared, they do most of the work and finish up before the deadline is due. We expected that the midterm action workers engage highly in time management behaviors as they plan to do most of the work after a certain amount of time. As a result, they may have a high perceived control of time and occupational self-efficacy, as well as display high job performance and effectiveness, and work little overtime.

Finally, we expected so-called 'deadline action workers' to procrastinate and thus to engage less in time management behaviors, experience less perceived control of time, and to be less effective. They are likely to show a lower performance and be less effective than so-

called ‘early action workers’, as they might have less time to perform and probably need to work overtime to complete their tasks before the deadline.

In summary, we expected the early action workers (Style 1), constant action workers (Style 3), and midterm action workers (Style 4) to engage most in time management behaviors, to experience control of time and occupational self-efficacy, to perform highly, to be effective, and to work little overtime. Furthermore, we expected early- and end term action workers (Style 2) and deadline action workers (Style 5) to engage least in time management behaviors, to experience less control of time and occupational self-efficacy, to show lower job performance and effectiveness, and to work more overtime than people with other styles.

Method

Sample and Procedure

Two hundred and four employees working in autonomous jobs in seven organizations (four service companies, three production companies) in the Netherlands¹ were recruited to participate in a comprehensive survey study on how people manage their time at work, taking into account personal factors. Of the recruited employees, 174 employees (a 86% response rate) returned usable surveys, but because only 167 employees indicated their pacing style, we used the latter sample. The surveys were self-administered; the instruction for completion was given on the first page. All respondents voluntarily completed the questionnaire and were given company time to respond. The survey contained pacing styles, time management behaviors, perceived control of time, and performance outcomes.

To be able to gather external ratings of performance and effectiveness, we asked each respondent to distribute a shortened version the survey they had just completed among one colleague and one supervisor (N = 408). Respondents knew that we were getting data on the result of their work behavior, more specifically, on the difference between their own ratings and the ratings of others, among others, their work effectiveness. In total, 298 usable questionnaires were returned, a response rate of 73%. Participating organizations were offered a summary of group results in exchange for their participation.

Measures

Respondents completed a questionnaire containing scales measuring pacing styles, time management behaviors, perceived control of time, and performance outcomes.

Individual pacing styles. Five different styles were developed, three of which were which were derived from Gevers, Rutte, van Eerde (2004) and two new styles were added.

¹ This sample was also used in Chapter 5 of this dissertation.

The first style presents the so-called ‘early action workers’ (Gevers et al. 2004), those who tend to work to start working on tasks as soon as possible in order to complete their work long before the deadline is due. The second style was constructed to represent those who preferred to perform most of the work at the start and when the deadline is near, which we named the ‘early- and end term action workers’. The third style (Gevers et al., 2004) included those who prefer to divide their activities equally over time, the ‘constant action workers’. The fourth style was constructed to present those who prefer to do most of the work halfway the deadline, which we named the ‘midterm action workers’. The fifth style (Gevers et al., 2004) consisted of those who did most of the work in a relative short period, just before the deadline was due, the so-called ‘deadline action workers’. Respondents were asked to select the style that fitted their general way of dividing their time on activities with respect the deadline.

Time management behaviors. Task assessment behavior refers to the scrutiny in accepting new tasks and responsibilities aimed at deciding whether these tasks should be performed by oneself or not. Those who score highly on task assessment do not (always) accept all tasks that they are asked to perform themselves or take responsibility for when performed by others. Task assessment behavior was measured with a seven-item study-developed scale (see Appendix Chapter 5). Example item: “Do you ever do the following: Tell your boss that you will give priority to other tasks than he suggested?”. Ratings were made on a 5-point scale from (almost) never (1) to (almost) always (5). *Planning behaviors*: Anchored planning, priority focus, and contingency planning (Tripoli,1998). Anchored planning, defined as the extent to which the employee’s planning process specifies goals, activities, and time frames, was measured with a 13-item scale. Example item: “I usually develop timetables for most projects on which I am working”. Priority focus, defined as a clear and broad focus on one’s work priorities, was measured with a six-item scale. Example item: “In my day-to-day work, it is often a struggle to keep my priorities in order”. Contingency planning, defined as an individual’s tendency to anticipate potential obstacles and alternative plans when carrying out work, was measured with a 6-item scale. Example item: “In my approach to work, I try to be adaptable to unexpected events”. Ratings were made on a 5-point scale from do not agree at all (1) to completely agree (5). *Time-monitoring* was measured with six study-developed items that referred to the person’s check of his/her time use (see Appendix Chapter 5). Example items: ‘While performing my work, I regularly check whether I’m working on schedule’, ‘While performing my work, I regularly check whether I performed what I intended to do’. Ratings were made on a 5-point scale from do not agree at all (1) to completely agree (5).

Perceived control of time was measured with a six item scale assessing the extent to which individuals believe they can directly affect how they manage their time (Claessens, van Eerde, Rutte, & Roe, in press). Example item: “I feel in control of my time”. Ratings were made on a 5-point scale from do not agree at all (1) to completely agree (5).

Occupational self-efficacy was measured with eight items (short OCCSEFF-scale, Schyns & von Collani, 2002). Example item: ‘Thanks to my resourcefulness, I know how to handle unforeseen situations in my job’. Ratings were made on a 5-point scale from completely true (1) to not at all true (5). As the original scale was in the English language, the scale was translated in Dutch by the first researcher. Then, the translation was checked by a sworn translator.

Job performance was measured by asking respondents to rate the performance of a person relative to other colleagues (Roe, Zinovieva, Dienes, & ten Horn, 2000). Eight statements, for example “It has been acknowledged that my job performance is higher when compared to other colleagues” could be rated (1) no, not true to (5) yes, that is true”. We also made the scale suitable to obtain supervisor and colleague ratings of respondents job performance, for example, “It has been acknowledged that the performance of the person I am evaluating is higher compared to other colleagues”. The correlation between supervisor and colleague scores on job performance of respondents was .46 ($p < .01$). Therefore, mean scale score of the combined supervisor and colleague ratings on job performance was calculated, and used in the analyses. In the next, we will refer to the combined supervisor/colleague ratings as ‘external’ rating of performance.

Effectiveness was assessed with twelve items that were developed especially for this study. Items were derived from relevant literature and tested in preliminary interviews with 17 employees of seven organizations working in autonomous jobs. These pilot employees were not included in the main survey sample. The items referred to the timeliness, quality of work, and reliability in meeting one’s commitments (see Appendix Chapter 5). Example item: “Usually, I am able to perform many things in little time”. Ratings were made on a 5-point scale from do not agree at all (1) to completely agree (5). The scale was also used in an adapted version in order to obtain supervisor/colleague ratings of respondents’ effectiveness. Example item: “Usually, the person I am evaluating is able to perform many things in little time”. The correlation between supervisor and colleague scores on effectiveness of respondents was .57 ($p < .01$). Therefore, a mean scale score of the combined supervisor and colleague ratings on effectiveness was calculated and was used in the analyses. In the next, we will refer to the combined supervisor/colleague ratings as ‘external’ rating of effectiveness.

Working overtime was measured with three items. The items were ‘I regularly work overtime’, ‘I complete my work within normal work hours’, and ‘I often take my work at home’. Participants responded to each item using a 5-point scale from do not agree at all (1) to completely agree (5).

Results

Data-analysis

Multivariate analysis of variance was used to evaluate the differences between the five different pacing styles with respect to the five time management behaviors, perceived control of time, occupational self-efficacy, and performance outcomes.

Descriptive statistics

Descriptive statistics, coefficient alphas, frequencies, and intercorrelations among the time management behaviors, perceived control of time, and performance outcome variables are presented in Table 1. It appears that the measures generally had adequate internal consistency for research instruments (0.70 or greater, see Nunnally, 1978), with the exception of the task assessment scale.

The respondents were relatively equally divided over the five different pacing styles. Of the 167 respondents, 16% indicated that the first style fitted their general way of working, 31% indicated the second style, 23% the third style, 13% the fourth style, and 17% the fifth style.

Individual pacing styles

Results of multivariate analysis of variance (MANOVA) demonstrated that the five pacing styles differed significantly on a number of variables (Wilks' $\Lambda = .41$, $F(52, 509) = 2.53$, $p < .01$). The multivariate η^2 based on Wilks' Λ was quite strong, .20. Table 2 contains the means on the dependent variables (time management behaviors, perceived control of time, performance, effectiveness, and working overtime) for the five pacing styles. Analysis of variances (ANOVA) on each dependent variable were conducted as follow-up tests to the MANOVA. Using the Scheffe method, each ANOVA was tested at the .025 level. The ANOVA's on anchored planning, priority focus, perceived control of time, occupational self-efficacy, working overtime, job performance, and effectiveness were significant. Post-hoc analysis to the univariate ANOVA for the significant dependent variables consisted of the comparisons of the five pacing styles to find which pacing style affected each of the dependent variables most strongly. Each comparison was tested at the .025 level.

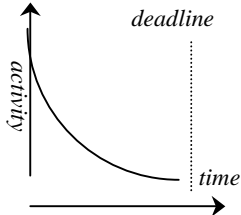
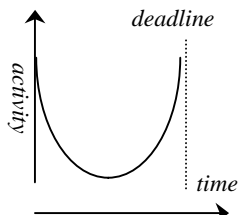
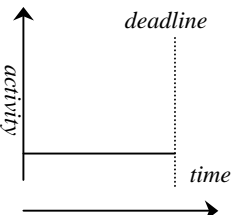
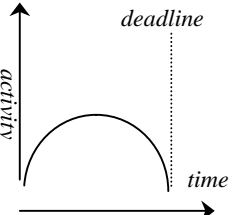
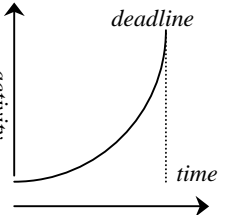
Table 1. Descriptive Statistics and Intercorrelations among Study Variables (N=167)

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Task assessment	3.77	.52	(.68)											
2. Anchored planning	3.35	.53	-.05	(.86)										
3. Priority focus	3.13	.38	-.11	.41**	(.76)									
4. Contingency planning	3.52	.49	.04	.35**	.28**	(.85)								
5. Time-monitoring	3.49	.50	-.16	.47**	.26**	.11	(.75)							
6. Perceived control of time	3.66	.59	.03	.25**	-.10	.13	.21**	(.77)						
7. Occupational self-efficacy	3.87	.48	.01	.41**	.04	.40**	.11	.55**	(.77)					
8. Working overtime	2.72	.77	-.16*	.01	.11	.16*	.07	-.22**	-.06	(.68)				
9. Job performance (self)	3.60	.61	-.01	.27**	.10	.29**	.08	.45**	.58**	-.10	(.73)			
10. Job performance (e)	3.56	.71	-.21*	.15	.01	.06	.06	.37**	.28**	.04	.46**	(.81)		
11. Effectiveness (self)	3.80	.39	.19*	.31**	.00	.11	.18*	.49**	.41**	-.30**	.48**	.20*	(.77)	
12. Effectiveness (e)	3.79	.48	-.09	.06	-.04	-.03	.06	.26**	.12	-.10	.28**	.61**	.30**	(.85)

Note. self = self-rating, e = external rating. Figures in parentheses are alpha reliabilities.

* $p < .05$, ** $p < .01$.

Table 2. Multivariate analysis of variance of five pacing styles (N=167).

		Pacing styles				
		Style 1	Style 2	Style 3	Style 4	Style 5
						
<i>Variable</i>		N = 28	N = 51	N = 38	N = 21	N = 29
<i>Time management behaviors</i>	Task assessment	3.80	3.81	3.78	3.74	3.64
	Anchored planning	3.43 _{ab}	3.27 _{ab}	3.59 _b	3.21 _{ab}	3.18 _a
	Priority focus	3.14 _{ab}	3.08 _a	3.28 _b	3.02 _a	3.12 _{ab}
	Contingency planning	3.50	3.48	3.64	3.54	3.46
	Time-monitoring	3.49	3.46	3.61	3.56	3.31
<i>Control</i>	Perceived control of time	3.84 _a	3.50 _b	3.71 _{ab}	3.83 _a	3.59 _{ab}
	Occupational self-efficacy	3.89 _{ab}	3.77 _a	4.03 _b	3.86 _{ab}	3.84 _{ab}
<i>Performance outcomes</i>	Job performance (self)	3.87 _a	3.30 _c	3.83 _a	3.63 _b	3.53 _b
	Job performance (e)	3.77 _a	3.31 _b	3.65 _{ab}	3.80 _a	3.54 _{ab}
	Effectiveness (self)	4.02 _a	3.68 _b	3.97 _a	3.67 _b	3.65 _b
	Effectiveness (e)	3.77 _a	3.58 _b	3.87 _a	4.09 _a	3.67 _b
	Working overtime	2.58 _{ab}	2.91 _b	2.49 _a	2.66 _{ab}	2.90 _b

(self) = self-rating, (e) = external rating: combined colleague/supervisor rating. Note. Different subscripts indicate significant differences.

The results are depicted in Table 2 with significant differences between the styles indicated with different subscripts (a, b, c).

As can be seen in Table 2, we found significant differences between the five styles with respect to anchored planning, priority focus, perceived control of time, occupational self-efficacy, working overtime, job performance, and effectiveness. The results will be discussed consecutively.

Time management behaviors

As demonstrated in Table 2, we found that respondents, with respect to their pacing style, only significantly differed in two planning behaviors and not in other time management behaviors. We found significant differences in anchored planning and priority focus. With respect to anchored planning, Style 3 engaged significantly more in anchored planning behavior than those with Style 5. In other words, the constant action workers planned their activities to a higher extent than the deadline workers. Furthermore, significant differences were found in priority focus. Respondents with Style 3 were more focused on their priorities than Style 2 and 4. Thus, the constant action workers focused more on their priorities than the early- and last-term action workers and mid-term action workers. The others styles did not significantly differ in anchored planning and priority focus.

Perceived control of time and occupational self-efficacy

We found significant differences in perceived control of time among the different styles. Early action workers (Style 1) and midterm action workers (Style 4) indicated a higher degree of perceived control of time than early- and end term workers (Style 2). The constant action workers (Style 3) indicated significantly higher occupational self-efficacy than the early- and end term action workers (Style 2).

Performance outcomes

We found significant differences between the styles with respect to all performance measures in our study.

The results for self-rated and external rated job performance and effectiveness indicated that those with style 1 and 3 generally had the highest scores in comparison to the other styles. Thus, we found that respondents with an early-action style (Style 1) or a constant-action style (Style 3) rated their job performance highest, and those with a early- and end term action style (Style 2) gave themselves lowest ratings. Also, the external raters of job performance indicated that those with early action styles (Style 1) had the highest

performance scores and those with a early- and end-term action style (Style 2) had the lowest scores.

The scores for effectiveness were almost the same. The early-action (Style 1) and constant-action (Style 3) workers rated themselves as relatively effective, whereas those with other pacing styles rated themselves as less effective. The external ratings of effectiveness also indicated that the early action and constant action workers were effective, but the midterm action workers (Style 4) appeared to be effective as well, and in absolute numbers this last style had the highest effectiveness ratings of all.

As for working overtime, we found that Style 2 significantly differed from style 3 indicating that the early- and end-term action workers relatively worked most overtime and the constant-action workers least.

Discussion

In the current study we investigated the relationship between pacing styles and the various constructs of the time management model developed by Claessens et al. (2004, Chapter 5). As we found that pacing styles were related to planning behaviors, perceived control of time, occupational self-efficacy, and performance, we tentatively conclude that pacing styles are an antecedent that might be added to the time management model.

We found some support for our expectations about the specific relations between each pacing style and the concepts of the time management model. Our results showed that the early action workers (Style 1), constant action workers (Style 3), and midterm workers (Style 4) planned most of their activities, perceived time to be under their control, experienced occupational self-efficacy, and had high performance ratings. However, contrary to our expectations, we did not find significant differences in the engagement in other time management than planning behaviors. The constant action workers (Style 3) planned their activities to a higher extent than the deadline workers did (Style 5). Apparently, deadline workers don't plan their activities in some detail as they start working on tasks just before the deadline is due and probably focus on completing this particular task alone. Although we did not investigate this latter aspect, deadline workers may be less polychronic, that is, less able to divide their attention over several activities within the same time than constant action workers are. As constant actions workers tend to divide the work on activities equally over time with respect to the deadline, they may have a higher need to plan when to work on tasks. Also, as they are perhaps more conscientious than deadline workers (which was established in Gevers et al. (2004) study), they may be more inclined to plan their activities in detail in order to ensure that they spent enough time on each of their work tasks to aim for maximum

performance results. In an interview study (Claessens, van Eerde, Rutte, & Roe, 2004, Chapter 4), this contrast in planning behavior was also noticed. Where some preferred to plan their tasks at a regular basis (either daily or weekly), others preferred not to plan out their work activities, but to take the day as it comes. This finding can also partly be explained by the planfulness concept by Frese et al. (1987). They stated that people differ in their goal orientation and planfulness, globally in three ways. First, some take their goals and plans very seriously and pursue to execute exactly what they had planned for themselves. Moreover, they start to act immediately after they have decided what they want to complete. In this regard, the description of these kind of people show similarities with the early action pacing style, as they also tend to start early and plan their tasks in more detail than others. Second, Frese et al. (1987) suggested that there are people who are less goal oriented, plan tasks, but tend to do things that they had not planned for themselves, as they let themselves be distracted by other things. Third, some people seem to hardly plan activities for themselves, perhaps only while executing tasks. Their plans tend to be less explicit and open to changes. Here we see similarities with the pacing style of deadline workers, as they had lowest planning scores. Thus, the results of our study showed that respondents with different pacing styles differed significantly in their engagement in planning behaviors, but not with respect to task assessment or time-monitoring behaviors.

Furthermore, we found that the early action workers (Style 1) and midterm workers (Style 4) indicated more perceived control of time than the early- and end term workers (Style 2). An explanation for this finding is that the likelihood of completion within the deadline increases, because late events cannot have a disturbing influence any more. The constant action workers (Style 3) indicated significant higher occupational self-efficacy than the early- and endterm workers (Style 2). Thus, the pacing styles were differentially related to perceived control of time and occupational self-efficacy. This finding is in line with Claessens et al. (2004, Chapter 5), which demonstrated an empirical distinction between these concepts.

As for the differences in performance, we found that the constant action workers (Style 3) also had high performance and effectiveness scores, as rated both by themselves and supervisors/colleagues. Also, the early action starters (Style 1) had high self-rated and external-rated performance and effectiveness scores. Thus, the self-ratings and external-ratings of performance and effectiveness corresponded to a great deal. Perhaps this is due to the higher likelihood of completing tasks within the deadline. Furthermore, the midterm workers were less positive about their performance than we had expected. Although, supervisors and colleagues rated them highly on performance and effectiveness. Surprisingly,

the deadline action workers did not receive lowest performance and effectiveness ratings. A possible explanation is that, although they work under time pressure, they still manage to complete their tasks within time and of acceptable quality probably as a result of working overtime.

The constant action workers (Style 3) worked least overtime and early- and end term workers (Style 2) and deadline action workers (Style 5) most.

Our study showed that, although most respondents (31%) indicated that they identified themselves with Style 2 (early- and end term workers) they did not score highly on perceived control of time, occupational self-efficacy, and worked most overtime. An explanation is perhaps that people think that it is best to start early, than rest for some time to think things over or give priority to their tasks. However, our results might indicate another explanation, after their first effort, they get distracted by other tasks and do not engage enough in planning. They might also get frustrated as they don't know how to finish their tasks and wait until the deadline is near and time pressure increases as they might think that this pressure positively affects their performance.

This study also had some limitations. A first limitation of our study is that we did not investigate to what degree pacing styles can be seen as a response to different work situations. We expected people to choose a pacing style that matches their personality characteristics, but pacing styles might relate to the work situation and hence be less stable over time. Gevers et al (2004) demonstrated that the early action workers were highly conscientious and deadline action workers were less conscientious, yet we do not have information about the relationship of the other styles and conscientiousness nor with other personality characteristics.

A second limitation of the current study is the inclusion of only five pacing styles, which were distinguished on a-priori grounds. There might be more pacing styles than the current ones. Other styles are conceivable as well, for instance, a combination of early action and midterm action workers, in which people do much of the work at the beginning, than rest for some time and evaluate what they have done so far, and use this evaluation to finish up the work long before the deadline is due.

Future studies should investigate other possible pacing styles in order to establish a complete set of pacing styles that can represent people's personal styles. Also, it would be interesting to investigate people's motives to choose a particular pacing style as we could now only speculate about these motives.

Conclusion

We conclude that the concept of individual pacing styles is promising as we have shown that individuals with different styles also differ with respect to planning behavior, perceived control of time, occupational self-efficacy, job performance, effectiveness, and working overtime. In order to determine the construct validity of the pacing styles measures, the relation with personality characteristics and situational determinants should be investigated as well as the stability of pacing styles over different tasks, projects, or work situations. Once more is known about the construct validity, we should investigate the implications for the time management model. For the time being, we suggest that pacing styles can be added as an antecedent to the time management model.

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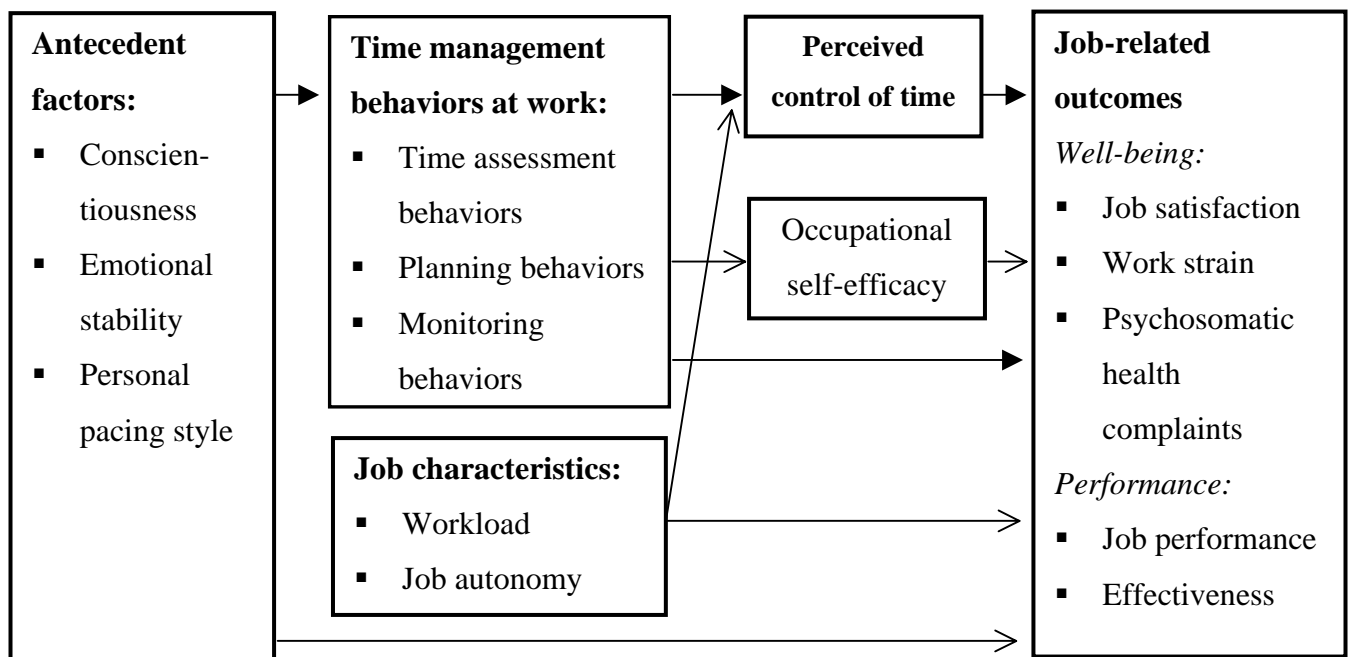
General discussion

In this concluding chapter, results of this dissertation study, as presented in the previous chapters of this dissertation, will be summarized, integrated, and discussed with respect to its contribution to research in the time management domain. Furthermore, limitations of the dissertation, suggestions for future research, and practical implications will be presented.

The main objective of the studies presented in this dissertation was to extend the theoretical modeling of time management in order to gain insight into time management behaviors and its effects on work performance and personal well-being.

Figure 1 presents the proposed theoretical model that guided our research. This model integrates all the concepts that proved to be significant in the different chapters of this dissertation.

Figure 1. Integrated model of time management



As can be seen in Figure 1, we investigated other *antecedent factors* than those included in past studies on time management (see Chapter 2 for an overview). In Chapter 3, we presented a study which demonstrated a positive relationship between conscientiousness, emotional stability, and the completion of planned tasks. This Chapter presented the results of a diary study and an interview study which examined detailed aspects of planning, prioritizing, and completing planned tasks. In this way, we gathered more information on the background of the planning and executing process. We were able to establish individual differences in planning, workday start-up behavior, and overall work style. In Chapter 6, a study on five individual pacing styles was presented. Pacing styles represent the way in which people tend to divide their work activities over time. They were studied in relation to time management behaviors, perceived control of time, and job performance. Results showed that, in general, people with different styles differed with respect to planning behavior,

priority focus, perceived control of time, and performance outcomes. Thus, this study provided a possible explanation why people vary in their planning and execution of work tasks.

Secondly, we added the role of *job characteristics*, which had not been part of time management research yet. We examined the importance of planning behavior, besides job characteristics, with respect to perceived control of time and job related outcomes (Chapter 3). Results showed that both planning behavior and job characteristics significantly affected the perceived control of time, which in turn was positively associated with job satisfaction and job performance and negatively with work strain. Additionally, a direct effect of planning behavior on job performance was found. Past studies found no effect of time management behavior on job performance (Davis, 2000; Macan, 1994) or only in interaction with achievement motivation (Barling, Kelloway, & Cheung, 1986), which implies that only those who are highly motivated to achieve, benefited from time management behavior in increasing their job performance. We were, to our knowledge, the first to demonstrate a direct effect of time management behaviors on performance, both self-rated and externally-rated.

Thirdly, we suggested and studied (Chapters 2 and 5) other *time management behaviors* than previously studied in time management research. Although all past time management studies (see Chapter 2 for an overview) included planning behavior, none of these studies focused on more detailed aspects of planning, such as the anticipation of possible obstacles during the execution of tasks in the planning of tasks. Furthermore, we introduced two additional time management behaviors: time assessment behaviors and monitoring behaviors. Time assessment behaviors refer to, among others, behaviors that incorporate the self-awareness of the use of one's time in deciding which proposed tasks to accept (task assessment behavior). Monitoring behaviors refer, among other things, to behaviors that aim at evaluating one's task execution with respect to time (time monitoring), and that incorporate the outcome of this evaluation in execution behavior. We studied the relationship between task assessment behavior, planning behaviors, time-monitoring behavior, perceived control of time, occupational self-efficacy, and job-related outcomes. Results showed that some of the time management behaviors were directly related to performance, effectiveness, and work strain. Also, we found that perceived control of time mediated the relation between several time management behaviors and all job-related outcomes. Additionally, we further investigated the role of perceived control of time, by including a theoretically related construct (occupational self-efficacy) as a second mediator. Results showed that the second mediator did not take up all of the relations between time

management behaviors, perceived control of time, and job-related outcomes. Therefore, we concluded that they served complementary rather than competing roles.

Fourthly, the studies presented in Chapter 3 and 5 both demonstrated that *perceived control of time* was significantly related to job performance, job satisfaction, and work strain, which confirmed that it is an important concept when studying time management behaviors. In Chapter 5, we demonstrated that perceived control of time can be distinguished from *occupational self-efficacy*. With respect to the consistency in results of the different studies, we found that the perceived control of time was not a significant predictor of the completion of planned tasks (Chapter 4), yet significantly predicted job performance (Chapter 3 and 5). An explanation is perhaps that planned task completion and job performance are not the same. Job performance might involve the completion of planned tasks, as well as unplanned tasks, and work interruptions.

Finally, we introduced an additional performance measure, *effectiveness* of work, and obtained external ratings (combined supervisor/colleague ratings) of respondents' job performance and effectiveness (Chapter 5). Where job performance was defined as the overall judgement of ones' achievements relative to others (Roe et al., 2000), we defined work effectiveness as a judgement of the extent to which desired results like timeliness, quality, and reliability are accomplished. We found that the relationships between perceived control of time and both performance outcomes were mostly the same, yet for the independent variables and occupational self-efficacy we found differential effects, indicating that the effectiveness concept added to the information collected with the job performance measure. Results demonstrated, for instance, a negative relationship between task assessment and externally-rated job performance, but a positive relationship with self-rated effectiveness (and no significant relationship with self-rated job performance), which implies that the view of others differs from the self-rating. We perceive job performance and effectiveness as complementary variables as they both measure performance, yet from a different perspective.

Theoretical contributions

We contributed to time management literature by introducing a theoretical model of time management based on Macan's (1994) model and an integration of ideas of other theories, i.e., action regulation theory (Hacker, 1985), self-regulation theory (Carver & Scheier, 1998), and goal-setting theory (Locke & Latham, 1990).

In our models, we presented a new perspective on time management behaviors at work and revealed some of the factors involved in time management behaviors on the one hand and the effects of time management behaviors on the other hand. Our research added to

the knowledge of time management behaviors, as we investigated the role of some antecedent factors, demonstrated the effect of planning behavior next to job characteristics, and showed the relationships between time management behaviors and job performance and personal well-being at work. As stated, to our knowledge, past time management research did not demonstrate any effect of time management behaviors on job performance. Our studies demonstrated that some time management behaviors directly affected job performance in addition to a direct effect, namely via perceived control of time and occupational self-efficacy.

We believe that our research has made some small contributions to action regulation theory, self-regulation theory, and goal-setting theory in reverse.

Action regulation theory (Hacker, 1985) postulates that people redefine the objective task (task-as-given, Roe, 1999) into a subjective task (task-as-taken, Roe, 1999), and then two regulation processes take place, emotional-motivational and cognitive regulation. These regulation processes affect the action preparation process (orientation, analysis and planning, evaluation and choice) which in turn determines the action execution process (generating, executing, and controlling). In our theoretical model, we included task assessment behavior and time-monitoring, which clearly relate to the ideas of the action regulation theory, and investigated their relation with job-related outcomes. We demonstrated that, for instance, task assessment behavior was associated with performance outcomes, but was also related to work strain, a well-being outcome. Thus, our contribution was twofold; we operationalized two ideas from action regulation theory, i.e. task redefinition and monitoring, in a specific way, and showed that they not only relate to performance outcomes, but also to well-being outcomes, which was not previously established. As Roe (1999, p. 238) stated, "Hacker's work, most of which has been published in German, shows clear parallels to American models of self-regulation". Carver & Scheier's (1998) model, for instance, postulated that people engage in a monitoring process by which they evaluate their performance with respect to preset norms and standards and adapt their task-execution accordingly. Again, in our theoretical model, we adopted this idea and converted it to monitoring oneself with respect to time. Self-regulation theory might have an interest in our study-developed time-monitoring measure as it refers to a specific self-regulation process.

Goal-setting theory (Locke & Latham, 1990) has incorporated self-efficacy to explain why higher goals may lead to a higher performance, but did not focus on the perceived control of time. We identified perceived control of time (Macan, 1994) as another important outcome of the goal setting and planning process and demonstrated its relation to performance and well-being outcomes of work. Thus, future goal-setting studies could

include perceived control of time as an additional mediator between goal-setting and planning and job-related outcomes.

Strengths and weaknesses of the studies

Strengths of the studies presented in this dissertation are firstly that we employed different methods (diary study, interview study, survey studies) to explore time management behavior and its relation to job-related outcomes. We gathered information about the factors involved in time management and its effects, but we also gathered in-depth information about the work processes. Although triangulation implies the application and combination of several research methodologies in the study of the exact same phenomenon (Herbert & Shepherd, 2001), which was not entirely the case in our research, we at least made an effort to use several methodologies to study time management behaviors.

Secondly, in comparison to much research in organizational literature, we used relatively large samples of highly-educated employees working in autonomous jobs. Although we had to set a condition for our samples with regard to autonomy, since low autonomy reduces the room for time management, we created variety in our samples by including respondents of eight different organizations. Furthermore, as opposed to past time management research, we did not use student samples to study time management behaviors at work. Student samples can be criticized for representing other characteristics than the work population it purports to represent, and as a consequence, the external validity of results can be disputed (Cooper & Schindler, 2003; Rogelberg, 2002). Student samples can be perceived as differing from worker samples in time management as students might have fewer tasks to perform in comparison to employees, they might be less committed to their work, feel less time pressured, and the negative consequences of their performance can be perceived as less far-reaching in terms of financial, status, or other consequences. Students samples are suitable to study the use of time management behaviors and its effects in study environments, though.

Thirdly, we adopted sophisticated techniques of analysis. The use of structural equation modeling technique allowed us to test a complete model at once, instead of the different parts of the model, which has the advantage of reducing the chance of type I error and of accounting for all other effects of variables. In Chapter 3, we employed multi-level modeling which takes the nested structure of the data into account. The nested structure of the data violates the assumption of independent observations made by most common data-analysis methods.

Fourthly, we developed new measures of task assessment, time-monitoring, effectiveness, and gathered external (combined supervisor/colleague) ratings of job performance and effectiveness. On the other hand, study-developed scales can also be viewed as a methodological limitation of our studies, as the validity and reliability of the measures can be disputed. In future studies, the construct validity, and in particular the discriminant validity of our developed measures will have to be established.

Finally, we studied the effects of planning behavior and job characteristics over time as we used a longitudinal design in two of our studies (Chapters 3 and 4). Although the design of the survey study presented in Chapter 4 can be criticized on some points, for instance the relatively short period (three months) between the first and second data-gathering moment, it demonstrated that perceived control of time resulted from planning behavior over time.

The studies presented in this dissertation also had some limitations, which we will discuss along with some suggestions for future research.

With regard to the generalizability of our study results, we only included samples of employees working in autonomous jobs. Our samples had to meet the condition that respondents could decide for themselves when to start working on tasks and could determine their own work pace. We set this condition to ensure that respondents had the opportunity to engage in time management behaviors. Although we did not study low job autonomy samples, we expect that our study results might be transferable to a low job autonomy situation to some extent. Employees are still likely to have regular feedback from their supervisors about work progress and discussions about the tasks that they perform themselves or that will be performed by coworkers. Task assessment behavior might also be applicable in their work situation. However, planning behaviors and monitoring behaviors are less likely to occur in these samples, as the employees are not able to decide about what tasks to perform. With respect to students, we anticipate that results might also hold for this population. Although students have no opportunity to omit study tasks, they can decide about the order and timing of their study activities. We expect students to engage in planning behavior, at least to some extent. Also, we expect them to be able to monitor their activities with respect to the deadlines. Thus, we anticipate that students are able to engage in time management behaviors and perceive time to be under their control. However, a requirement for planning is that one has to be able to (roughly) estimate the time needed to complete a particular task and to have some idea about the number of tasks one is able to perform within a certain timeframe. As not all students may find it easy to plan tasks for themselves and to monitor time, they might benefit from time management training programs. Future studies should

investigate the effect of antecedent factors on student time management behaviors. Thus, the relevance and effects of our suggested time management behaviors could be included in future studies in low job autonomy samples or in student samples.

Another limitation in terms of generalizability is that the work or respondents in our sample involved deadlines to which they had to live up. Work situations in which deadlines are less apparent, time management behaviors might have less effects. The level of temporality, that is, the extent to which work involves deadlines (Roe & Zijlstra, 2000), might determine the importance and effects of time management behaviors. Future research could establish the level of temporality of work situations in which time management behaviors are effective.

With regard to the research methods employed, a limitation of the studies presented in Chapters 5 and 6 was the cross-sectional nature of the data, which implies that the causality of the relations can be disputed, as we could not study the relations over time. Therefore, we cannot rule out the option that the relationships can, in fact, be in the opposite direction from what we had anticipated. Perceived control of time, for instance, could also be an outcome of job performance instead of only being a predictor. Moreover, it might be a predictor of time management behaviors rather than an outcome, although it is likely that this is not the case, since we established (Chapter 4) that planning behavior measured at Time 1 affected perceived control of time measured at Time 2. Future research should take these options into account and further investigate the causality of relations in longitudinal studies or quasi-experiments.

Future research

Although we believe that our studies made a substantial contribution to time management research, many topics and questions remain to be addressed in future studies. As proposed in the previous paragraph, future studies could focus on investigating causal relationships, in order to establish the antecedents and consequences of engaging in time management behaviors. To determine causality, at least three criteria should be met; there should be a statistical significant association between the variables of study (covariation), this association should not be due to effects of other variables (non-spuriousness), and a change in the 'causal' variable should bring about a change in the 'effect' variable and not the other way around (temporal order of events) (Taris, 2000). De Lange, Taris, Kompier, Houtman, & Bongers (2003) also stipulated the condition of having a plausible theory about the direction of causality and ruling out alternative explanations. The study presented in Chapter 4 incorporated some of these conditions. Future time management research should incorporate

all of these conditions to establish causality between time management behaviors and outcomes.

Also, establishing the validity and reliability of our study-developed measures could be the focus of attention of future research. Time monitoring, for instance, could be studied in relation to other self-regulation tactics to determine its discriminant validity. The same is true for pacing styles. To determine the discriminant validity of the pacing styles, the relation with personality variables, such as conscientiousness and time urgency, should be investigated.

Another suggestion for future research is the focus on motivational aspects with respect to engaging in time management behaviors in general, and in particular with respect to execution of work as planned. As stated in Chapter 3 of this dissertation, a much observed phenomenon in organizations is the fact that people set tasks for themselves, but do not complete or not even start executing what they had planned for themselves. Gollwitzer (1999) stated that making implementation intentions itself was enough to trigger oneself to create the energy and motivation to execute these intentions. Yet, our diary study demonstrated that respondents only completed some part of their preplanned tasks, even when we had asked them to think about the importance, urgency, and attractiveness of tasks and prioritize their task, which can be viewed as a form of making implementation intentions. Work interruptions and unplanned tasks are quite probably only part of the reasons that they did not execute their plans, and we anticipate motivational aspects to be another important reason. It is expected that motivational aspects affect whether and how people engage in time management behaviors, but also affect performance outcomes of work. We did not explicitly study the influence of motivation in relation to the concepts of our theoretical model.

Future studies might expand our selection of time management behaviors. In Chapter 2, we proposed time management behavior to be composed of three types of behaviors: (1) time assessment behaviors, (2) planning behaviors, and (3) monitoring behaviors. In Chapter 5, we studied one aspect of time assessment behavior (task assessment), several planning behaviors, and one aspect of monitoring behavior (time-monitoring). We chose these particular time management behaviors as we were most interested in these concepts. Future research could focus on investigating other time management behaviors at work.

We propose that *time assessment behaviors* involve task assessment (relating one's tasks to time), but also involve behaviors that are aimed at determining the number of hours available for working with respect to work interruptions, the balance between work time and personal time (relating the balance work/home to time, work recovery), but also involves an assessment of how one's feelings and emotions on a daily basis are ("how do I feel today") and relating this to the timing and execution order of activities. In summary, time assessment

behaviors aim at creating time awareness and incorporating time in setting the preconditions to start preparing for action. *Planning behaviors* involve the behaviors that we studied in Chapter 5, anchored planning, contingency planning, and priority focus. In other words, they include planning goals, activities, and time frames in some detail, taking potential obstacles into account in alternative plans in case the original plans cannot be executed, and having a broad focus on one's work priorities when preparing for action. *Monitoring behaviors* involve time-monitoring, but also behaviors aiming at monitoring the input of one's work environment with respect to time. More specifically, we propose that they consist of monitoring whether coworkers or team members deliver their part of the job on time and whether the department or organization provides the information and means needed to perform one's job on time.

Future studies might also expand our selection of concepts relevant to time management behaviors and for instance include time-related personality variables, such as time urgency (Conte, Landy, & Mathieu, 1995), and polychronicity (Slocombe & Bluedorn, 1999), and work characteristics such as work interruptions and distractions (Zijlstra, Roe, Leonora, & Krediet, 1999), goal clarity (Kleinbeck & Fuhrmann), task complexity (Kernan, Bruning, & Miller-Guhde, 1994), or the effects of leadership style (Fairbrother & Warn, 2003).

Finally, another avenue for future research concerns studying the effects of time management interventions, such as time management training programs aimed at teaching our proposed time management behaviors, to establish the practical value of our suggestions.

Practical implications

The research presented in this dissertation also has some practical implications for both individuals and organizations. Most organizations expect a high performance of their employees in terms of timeliness and quality of work, but also aim to prevent negative job consequences in terms of strain and psychosomatic health complaints. A timely performance is related to satisfied employees, but also to satisfied customers and co-workers. Our studies demonstrated that time management behaviors contributed to a higher job performance and job satisfaction, but also to decreasing work strain and psychosomatic health complaints.

At the level of the individual, our research demonstrated that certain time management behaviors have both a direct and an indirect effect on performance. This implies that in order to increase one's job performance and effectiveness, the development of training programs aimed at teaching these specific time management behaviors might be helpful.

Also, existing time management training programs could be evaluated according to the suggested time management behavior elements and expanded accordingly.

Furthermore, we demonstrated that time management behaviors were associated with job-related well-being. In particular, task assessment was found to be negatively related to work strain which implies that being critical in the acceptance of assigned work tasks can be viewed as an effective work strategy to reduce negative consequences of time pressure. Other time management behaviors also had a direct and indirect effect on well-being. Although we expect most people to profit from time management behaviors, our and other studies demonstrated that there are individual differences in planning and executing behaviors. Therefore, we argue that time management training programs should be developed to serve different kinds of people. This could be done by means of a 'diagnostic' or screening tool, for instance in the form of a diary study, prior to the actual time management training after which people with the same kinds of problems with time (for instance personal planning problems) could be invited to participate in custom-made programs.

Currently, most time management training programs ask participants prior to the actual training program to note and evaluate their time spending, but they do not use this information to select respondents for a particular type of time management training. As a result, participants may receive a training in all elements of time management behaviors, including those in which they were already competent. This can reduce the learning effect as relatively little time is used to discuss their particular problems and to teach them the behaviors that might be beneficial to their particular situation. It is our observation that most time management trainers only previously select respondents based on similar job positions (e.g., secretaries, managers), probably as they expect them to have similar time management problems at work. Our research, as well as previous studies, found some support for a dispositional nature of time management behaviors, implying that selecting participants with similar time management training problems and personal characteristics might be more effective than selecting those with similar job positions.

Another observation of current time management training programs is their main focus on discussing participants' personal problems and inviting other participants to reflect on these problems and to think aloud about possible solutions to their problems. Although participants may find this useful, the negative side of it is that participants could also be taught behaviors that are not effective in solving their personal problems. In other words, we argue that time management trainers take notice of and implement results of scientific time management studies in time management training programs to ensure that participants are

made familiar with behaviors that have been identified as beneficial to job performance and personal well-being.

Another point is that in practice, time management is an important part of the treatment of patients with a burnout diagnosis. We examined the processes involved (perceived control of time, occupational self-efficacy) and demonstrated that these processes indeed helped to decrease work strain and psychosomatic health complaints in a work population. In addition, we found a direct effect of task assessment behavior on work strain which implies that by carefully assessing assigned tasks not only with respect to the time available but also to one's capabilities, and by accepting the tasks that one feels able to perform within these boundaries, one feels less pressured at work. As burnout studies (Maslach, Schaufeli, & Leiter, 2001) demonstrated that a long period of work strain is associated with an increased chance on burnout, we wonder whether our findings might also be useful for the treatment of burnout patients. Future research should investigate whether our finding also hold for patient populations.

At the level of the organization, there are at least three practical implications. First, organizations could encourage their employees to engage in time management behaviors in order to reach a perceived control of their time and occupational self-efficacy. They could train employees in managing time, but also appraise and reward them in doing so. To encourage work effectiveness, we suggest to include an evaluation of an employee's effectiveness as a point of discussion in yearly performance evaluations. Currently, at least in the Netherlands, employees' performance is evaluated yearly based on a number of indicators, for instance, the extent to which they lived up to their sales or production targets, the extent to which they performed managerial tasks, or the extent to which they initiated the improvement of quality of work. In the organizations we studied, effectiveness was not a performance-indicator although how and how well employees perform is also important next to what they had performed. Moreover, as time has become more important in work situations especially in the last two decades, it seems logical to evaluate time use.

Furthermore, in a different vein, managers could focus on employees' perceived control of time, and introduce changes in the work setting (e.g. relating to workload and job autonomy), when employees feel that time is not sufficiently under their control. As our research clearly demonstrated that perceived control of time is associated with positive performance and well-being outcomes of work, managers should look for possibilities to support employees to perceive time to be under their control. Also, organizations might provide means to avoid work interruptions that decrease the performance of employees. For instance, they could establish silent workplaces that allow for working concentrated and

reducing interruptions. Also, as the diary study revealed that interruptions mainly consisted of telephone calls and colleagues walking in asking questions, another example would be to make arrangements at department level, with regard to the office hours that employees are available for questions of coworkers, and customers if possible, to compress the interruption-time.

Finally, results showed that people with certain personality characteristics (conscientiousness and emotional stability) and certain pacing styles have a tendency to engage more in time management behaviors, to experience a higher perceived control of time and occupational self-efficacy, and score higher on job-performance and effectiveness. Thus organizations may improve their performance and effectiveness by selecting people with these characteristics and pacing styles.

In conclusion, this dissertation added to the knowledge of time management behaviors and effects and presented several directions for future research in the time management domain.

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Appendix A

Design Daily Diary Study

Number person: _____
 Date: _____

Time morning _____
 Time evening _____

Priority	Planned tasks	Important?		Urgent?		Attractive?		finished %*	Explanation*
		-	+	-	+	-	+		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Unplanned tasks*		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Please note work interruptions								Total time work interruptions?	

* fill in at the end of the workday

see the other side for more questions

Some more questions about your workday

Did you work overtime today? yes

no

If yes, for how many hours? _____ hours

Can you guess the total time spent on :

planned tasks? _____ %

unplanned tasks? _____ %

work interruptions? _____ %

private matters? _____ %

Concluding remarks about your workday

Did you skip tasks that you think you should have done?

yes

no

Here you see five faces. Please check which face fits how satisfied you felt in your job today.

How satisfied are you in your job today?



1.

2.

3.

4.

5.

Thank you for your cooperation

Appendix B
Developed Measures

Appendix

Task Assessment items

Do you ever do the following

1. ask a co-worker to take over some of your tasks.
 2. tell your boss that you don't have time to perform a certain task.
 3. tell your boss that it is not part of your job to perform a certain task.
 4. tell your boss that you will ensure that your task will be performed by a co-worker.
 5. tell your boss that you give priority to other tasks than he suggested.
-

Time Monitoring items

While executing my tasks, I regularly check

1. whether I will attain my goals.
 2. whether my work is on schedule.
 3. whether I am making the best use of my time.
 4. whether I have performed what I intended to do.
 5. whether I can use my time in a better way.
 6. whether there is progress.
-

Effectiveness items

In general,

1. I manage to do many things in little time.
 2. I put off deadlines. (R)
 3. I complete my work within time.
 4. I complete my work within the time I had planned for it.
 5. I work as efficiently as I can.
 6. I go home on time.
 7. I find it more important to deliver good work in stead of on time.
 8. I always deliver high quality work.
 9. I feel uncomfortable when my work is not a 100%.
 10. I perform what I promised to others.
 11. I live up to my promises.
 12. I forget the promises that I made. (R)
-

(R) reverse scoring item.

Summary

During the last two decades much has changed in the both the nature of work and the working environment, making the efficient and productive use of time at work an important factor to both managers and employees. Work has to be delivered timely and under continuously increasing time pressure. Time management was introduced as a method to help employees cope with these demands. Time management books and training programs have become quite popular among managers and employees. Surprisingly, relatively little scientific research has been devoted to the effects of time management training programs and time management on job performance or work strain. The present dissertation aims to fill this gap.

After an introduction to this dissertation, an overview of the literature on time management is given, which includes antecedent factors of time management and effects on performance and personal well-being. The definitions of time management and research methods used, and gaps in research, are discussed. The literature review demonstrates that relatively few scientific studies were devoted to time management when compared to the amount of non-scientific material on the subject. Furthermore, past studies varied considerably in their conception of time management, and together, in our view, only covered part of the spectrum. A new and comprehensive definition of time management behaviors is introduced. Three types of behavior are represented: time assessment, planning, and monitoring. The review shows that, so far, only one theoretical model of time management has been introduced and tested (Macan, 1994). In this model, time management behaviors are assumed to effect job performance and work strain indirectly, namely via perceived control of time. In other words, the model holds that the engagement in time management behaviors is related to a higher perceived control of time, which in turn is positively related to job performance and personal well-being. Only limited support for this model was found.

Next, an empirical study is presented which was designed to test parts of Macan's (1994) model with data gathered at two points in time. In this way, the relationships between time management behavior, perceived control of time, and job-related outcomes (job performance, job satisfaction, and work strain) could be studied for a certain period as well as investigating

the direction of the suggested relationships. With respect to different types of time management behavior, we limited the study to planning behavior given that the literature review showed that it is considered to be the most important type of time management behavior. As opposed to past studies, the model was extended by adding two job characteristics, perceived workload and job autonomy, in order to investigate the importance of planning behavior in relation to workload and job autonomy. Planning behavior, workload, and job autonomy were examined with respect to perceived control of time and job-related outcomes. A new scale was developed to measure perceived control of time. Results showed that planning behavior, workload, and job autonomy influenced both perceived control of time and job related outcomes. It appeared that by planning, job performance was positively affected in two ways. On the one hand, planning behavior positively affected job performance, and on the other hand, planning led to more perceived control of time which in turn, was positively related to job performance. This study showed that there was an effect over time since planning behavior and job characteristics measured at Time 1 were relatively strongly related to perceived control of time at Time 2. Summarizing, planning behavior, workload, and job autonomy affected the perceived control of time, the experience of which in turn was an important factor with respect to the experienced job performance, job satisfaction, and work strain. In addition to this, the study showed a direct relation between planning behavior, job characteristics, and job-related outcomes. It was concluded that the presented time management model was valid and provided a point of departure for future research.

To further develop the time management model, a second study was designed to broaden the investigation of the relationship between the different types of time management behavior on the one hand and job-related outcomes on the other hand, and to further determine the mediating role of perceived control of time. The model was extended in a number of ways. Firstly, the different types of time management behavior were measured in a more comprehensive manner, by including not only planning but also time assessment and monitoring. Scales were developed to measure time assessment and monitoring. Secondly, the effect of perceived control of time was further studied by comparing it with a theoretically related construct, namely occupational self-efficacy. Thirdly, the model was extended by the inclusion of additional performance measures, among which combined performance and effectiveness ratings of colleagues and supervisors. The study included several job-related outcomes, namely job performance and effectiveness (both self-rated and externally-rated), job satisfaction, work strain, and psychosomatic health complaints. It was

found that the different types of time management behavior were, as in the previous model, directly related to job-related outcomes as well as indirectly, namely via perceived control of time and occupational self-efficacy. Furthermore, it was found that perceived control of time was related to all job-related outcomes, whereas occupational self-efficacy was mainly related to personal well-being at work. It was concluded that this study added to the insight into the relations between the different time management behaviors and job-related outcomes. The inclusion of occupational self-efficacy was a valuable addition, yet it did not suppress the effect of perceived control of time.

Given that planning behavior was, in past studies, identified as an important time management behavior, we aimed to study planning behavior and the completion of planned tasks in more detail. For this purpose, two studies were designed.

Firstly, a daily diary study was conducted in which respondents were asked to note their planned tasks for the day and the anticipated importance, urgency, and attractiveness of each task and task priority at the beginning of their workday. At the end of their workday they were asked to indicate the percentage of each planned task completed. Unplanned tasks and work interruptions that came up during workdays could also be noted. Results showed that people tended to give highest priority to important and urgent tasks, whereas attractiveness did not seem to matter. They tended to perform the highest priority tasks, but also the urgent, yet unimportant tasks. Thus, a discrepancy between planned and performed tasks was found and results confirmed the suggestion of other authors that people tend to perform the urgent rather than important tasks first. Furthermore, respondents that had participated in a time management training program prior to the current study completed more of their planned tasks than others. Also, more emotionally stable and more conscientious respondents completed more of their planned tasks than others.

Secondly, an interview study was performed which we designed to study individual differences in the planning and executing of work tasks that may explain some of the results of the daily diary study. Respondents appeared to differ in the extent to which they engage in planning and prioritizing of work tasks. Also, respondents differed in their workday start-up behavior and in their execution behavior. The results of these two studies added to the knowledge of how people plan tasks for themselves, which tasks they perform and how they differ in the planning and executing of their work tasks.

We were also interested in investigating how individual pacing styles related to time management behaviors, perceived control of time, occupational self-efficacy, and job

performance. Individual pacing styles represent the way in which people tend to divide the frequency of their work activities over time with respect to deadlines. Five different styles were studied, including 'early starters'; individuals who tend to start early and complete most of the work well before the deadline. Results showed that, in general, people with different styles differed with respect to planning behavior, priority focus, perceived control of time, and self-rated and externally-rated job performance and effectiveness. One example is that the early starters showed more planning behavior, experienced a higher level of control of time and occupational self-efficacy, and had higher self-rated and externally-rated job performance and effectiveness than two of the other styles. This study provided an additional measure of how people vary in their planning and execution of work tasks.

Finally, the results of all studies and the connections between these results are discussed. An integrated model of time management is presented that consists of the investigated antecedent factors of time management behaviors at work on the one hand and the role of job characteristics and effects of time management behaviors on the other hand, including the perceived control of time. Furthermore, the strengths and weaknesses of the studies are reviewed and suggestions for future research are presented, such as the employment of different methods to explore time management behavior and the use of more sophisticated analysis techniques. Future studies could include other samples and further investigate the antecedents and effects of the suggested time management behaviors. Finally, the practical implications of the studies presented are discussed. In practice, the results of the studies can be used in several ways. One example would be introducing the time management behaviors presented in this dissertation into existing and future time-management training programs, the effects of which are supported by this scientific research.

In conclusion, the studies presented in this dissertation demonstrated that the engagement in time management behavior did affect people's job performance, effectiveness, and personal well-being at work and showed that the extent to which people perceived time to be under their control appeared to be an important concept in this process. In addition to this, this dissertation adds to the insight in the role of individual differences in planning and executing work tasks. Insight into time management behaviors and its effects contributes to the actions both individuals and organizations can take to encourage or enhance the engagement in time management by which performance, effectiveness, and personal well-being at work can be affected.

Samenvatting

(Summary in Dutch)

In de afgelopen jaren is de aandacht voor tijd op het werk toegenomen als gevolg van vele ontwikkelingen in het werk en de werkomgeving en is tijd een belangrijk onderwerp geworden voor zowel het management als de werknemers. Werk moet tijdig afgeleverd worden en de werkzaamheden moeten worden uitgevoerd onder een continu toenemende tijdsdruk. Timemanagement is rond 1950 geïntroduceerd als een methode om medewerkers te helpen omgaan met deze toenemende tijdsdruk en hogere eisen aan het werk. Timemanagementboeken en timemanagementtrainingen zijn nog steeds in toenemende mate populair onder zowel managers als werknemers. Het is dan ook verrassend te noemen dat er relatief weinig wetenschappelijk onderzoek is verricht naar de effecten van zowel timemanagementtrainingen als timemanagementgedrag op de werkprestatie en de werkdruk. Dit proefschrift is erop gericht deze kloof te overbruggen.

Na de introductie op het proefschrift wordt er een overzicht gegeven van de literatuur over timemanagement inclusief de antecedenten en effecten van timemanagementgedrag op prestatie in het werk en persoonlijk welbevinden. Hierbij worden ook de in bestaande studies gebruikte definities van timemanagement, de toegepaste onderzoeksmethoden en de ontbrekende onderwerpen in het onderzoek besproken. Het literatuuroverzicht laat zien dat er relatief weinig studies gewijd zijn aan timemanagement, zeker wanneer men deze afzet tegen de niet-wetenschappelijke aandacht voor dit onderwerp. Daarnaast blijkt dat eerdere studies aanzienlijk verschilden in hun opvatting over wat timemanagement inhoudt en dat deze definities tezamen naar onze mening slechts een deel van het spectrum omvatten. Wij introduceren een nieuwe en uitgebreide opvatting van timemanagement, welke bestaat uit drie typen gedrag: het beoordelen van tijd (time assessment), het plannen (planning) en het controleren van tijd (monitoring). Uit het literatuuroverzicht komt ook naar voren dat er tot dusver slechts één theoretisch model over timemanagement is ontwikkeld en getoetst (Macan, 1994). In dit model wordt verondersteld dat timemanagementgedrag de prestatie op het werk en werkdruk indirect beïnvloeden, namelijk via het ervaren van controle over de tijd. Met andere woorden, het model stelt dat men door timemanagementgedrag te vertonen meer controle over de eigen tijd zal ervaren, waardoor men een hogere prestatie in het werk en een

beter persoonlijk welbevinden op het werk zal hebben. Er is slechts zeer beperkt wetenschappelijk bewijs voor dit model gevonden in eerdere studies.

Verder wordt er in dit proefschrift een empirische studie gepresenteerd die wij hebben ontworpen om delen van Macan's (1994) model te toetsen met data die op twee verschillende tijdstippen zijn verzameld. Hierdoor werd het mogelijk om de effecten van timemanagement op de ervaren controle over tijd en enkele werkgerelateerde uitkomsten (werkprestatie, arbeidstevredenheid en werkdruk) gedurende een bepaalde periode te bestuderen alsmede de richting van de veronderstelde verbanden te onderzoeken. Met betrekking tot de verschillende soorten timemanagementgedrag hebben we de studie beperkt tot plangedrag, aangezien uit het literatuuroverzicht is gebleken dat dit als één van de belangrijkste onderdelen van timemanagement wordt beschouwd. In tegenstelling tot eerdere studies is het model uitgebreid met twee werkkenmerken, te weten werklast en werkautonomie, om het belang van plangedrag naast werklast en werkautonomie te kunnen vaststellen. Er is getoetst hoe plangedrag en deze werkkenmerken zich verhouden tot het ervaren van controle over de eigen tijd en tot de genoemde werkgerelateerde uitkomsten. Om de ervaren controle over tijd te meten is een nieuwe maat ontwikkeld. De resultaten laten zien dat plangedrag, werklast en autonomie zowel het ervaren van controle beïnvloeden als de werkgerelateerde uitkomsten. Het blijkt bijvoorbeeld zo te zijn dat door te plannen, de prestatie op het werk op twee manieren positief wordt beïnvloed: enerzijds is er een rechtstreeks verband, anderzijds leidt plannen tot het ervaren van controle over de eigen tijd wat ook positief samenhangt met de prestatie in het werk. Deze studie laat zien dat er sprake is van een effect over de tijd aangezien het plangedrag en de werkkenmerken gemeten op tijdstip 1 nog steeds een relatief sterk effect op de ervaren controle over de tijd laten zien op tijdstip 2. Samengevat laat deze studie zien dat plangedrag, werklast en autonomie in het werk de ervaren controle over de tijd beïnvloeden en dat het ervaren van controle positief gerelateerd is aan het niveau waarop men presteert, tevreden is over het werk en omgaat met werkdruk. Daarnaast laat deze studie zien dat er ook sprake is van een directe relatie tussen plangedrag, werkkenmerken en werkgerelateerde uitkomsten. Geconcludeerd wordt dat het timemanagementmodel dat in deze studie wordt gepresenteerd verdedigbaar is en goede uitgangspunten biedt voor verder onderzoek.

Om het timemanagementmodel verder te ontwikkelen is een tweede studie opgezet met het doel de relatie tussen de verschillende typen timemanagementgedrag aan de ene kant en werkgerelateerde uitkomsten aan de andere kant verder te onderzoeken en de mediërende rol

van het ervaren van controle over de eigen tijd verder vast te stellen. Hiertoe is het model op meerdere punten uitgebreid. Ten eerste zijn de verschillende typen timemanagementgedrag op een uitgebreidere manier gemeten door niet alleen plangedrag maar ook gedrag betreffende de beoordeling van tijd en het controleren van tijd te meten. Er zijn hiervoor nieuwe schalen ontwikkeld. Ten tweede is het effect van de ervaren controle over tijd verder onderzocht door deze af te zetten tegen een theoretisch gerelateerd concept: de inschatting van het eigen kunnen op het werk ofwel de mate waarin mensen zich in staat achten gebeurtenissen op het werk te beheersen die hun leven beïnvloeden (occupational self-efficacy). Ten derde is het model uitgebreid met meerdere werkgerelateerde uitkomsten, onder meer door een oordeel van collega's en leidinggevenden over de werkprestatie en effectiviteit van respondenten op te nemen. In deze studie zijn de volgende werkgerelateerde uitkomsten opgenomen: werkprestatie en effectiviteit in het werk (zowel eigen oordeel als dat van anderen), arbeidstevredenheid, ervaren werkdruk en psychosomatische klachten. Uit de resultaten komt naar voren dat de verschillende typen timemanagementgedrag net als in het eerdere model zowel een directe relatie hebben met de werkgerelateerde uitkomsten als een indirecte relatie, namelijk via het ervaren van controle over tijd en de inschatting van het eigen kunnen op het werk. Voor de afzonderlijke timemanagementgedragingen blijken deze relaties anders te liggen. Verder blijkt het ervaren van controle over tijd een invloed te hebben op alle werkgerelateerde uitkomsten, ook het oordeel van collega's en leidinggevenden, waar de inschatting van het eigen kunnen slechts aan enkele werkgerelateerde uitkomsten gerelateerd was. Geconcludeerd wordt dat deze studie meer inzicht geeft in de diverse relaties tussen de afzonderlijke timemanagementgedragingen en de werkgerelateerde uitkomsten. De toevoeging van de inschatting van het eigen kunnen bleek waardevol te zijn maar onderdrukte niet het belang van het ervaren van controle over de tijd.

Aangezien plangedrag door eerder studies geïdentificeerd was als een belangrijke timemanagementgedraging, is het plannen en uitvoeren van taken op een gedetailleerd niveau onderzocht. Hiertoe zijn twee studies opgezet.

Ten eerste is er een dagboekstudie uitgevoerd om te onderzoeken hoe mensen plannen en wat zij hiervan uitvoeren. Respondenten planden gedurende enkele weken aan het begin van hun werkdag hun taken voor die dag en gaven aan in hoeverre zij deze taken belangrijk, urgent en aantrekkelijk vonden. Daarnaast gaven zij aan welke prioriteit zij aan deze taken gaven. Aan het einde van de werkdag gaven zij, in percentages, aan hoeveel van deze taken zij hadden afgerond. Daarnaast werden ongeplande taken en werkinterruptions die gedurende de werkdag voorkwamen genoteerd. De resultaten van deze studie laten onder meer zien dat men geneigd

is om de hoogste prioriteit te geven aan belangrijke en urgente taken. De mate waarin een taak als aantrekkelijk wordt beschouwd bleek hierin geen rol te spelen. Verder blijkt dat men geneigd is de hoogste prioriteitstaken af te ronden, maar ook de urgente, niet-belangrijke taken worden in hogere mate afgerond dan andere taken. Er bestaat dus een discrepantie tussen wat men zich voorneemt te doen en wat men uitvoert. Deze resultaten ondersteunen de suggesties van andere onderzoekers dat men geneigd is de urgente taken eerst te doen. De resultaten laten ook zien dat respondenten die voorafgaand aan deze studie een timemanagementtraining gevolgd hadden meer van hun geplande taken af hadden dan anderen. Meer emotioneel stabiele en consciëntieuze respondenten ronden ook meer van hun geplande taken af.

Ten tweede is er een interviewstudie uitgevoerd die wij hebben ontworpen om individuele verschillen in het plannings- en uitvoeringsproces te onderzoeken, die mogelijk de resultaten van de dagboekstudie zouden kunnen verklaren. Uit de resultaten blijkt dat respondenten verschillen in de mate waarin zij doorgaans hun werkzaamheden plannen en prioriteiten stellen. Daarnaast blijken zij verschillende gedragingen te vertonen in het opstarten van hun werkdag en in het uitvoeren van hun werk. De resultaten van deze twee studies dragen bij aan de kennis over hoe mensen hun eigen taken plannen en hoe zij verschillen in het plannen en uitvoeren van werkzaamheden.

We waren ook geïnteresseerd in de relatie tussen individuele stijlen in het verdelen van werkactiviteiten over de tijd met betrekking tot deadlines (pacing styles) en timemanagementgedragingen, het ervaren van controle over de eigen tijd, de inschatting van het eigen kunnen en de prestatie en effectiviteit in het werk. Deze individuele stijlen representeren de wijze waarop men geneigd is de frequentie van werkactiviteiten over de tijd te verdelen. In deze studie zijn vijf verschillende stijlen opgenomen, waaronder 'vroeg starten' met het werken aan taken zodat deze ruim voor de deadline afgerond zijn. De relatie tussen deze stijlen werd onderzocht met betrekking tot de meeste elementen van het model uit het vorige hoofdstuk, te weten: de verschillende typen timemanagementgedrag, de ervaren controle over de tijd, de inschatting van het eigen kunnen en de prestatie en effectiviteit in het werk. Resultaten laten zien dat in het algemeen mensen met verschillende stijlen significant verschillen in plangedrag, focus op prioriteiten, de ervaren controle over tijd en in hun prestatie in het werk. Dit is zowel het eigen oordeel als dat van anderen (collega's en leidinggevenden). Een voorbeeld is dat de mensen die 'vroeg starten' meer plangedrag vertonen ten opzichte van twee andere stijlen, meer controle over de eigen tijd ervaren, hun eigen kunnen in het werk hoger inschatten en een hogere werkprestatie en effectiviteit in het

werk hebben dan anderen, zowel volgens eigen oordeel als dat van collega's en leidinggevend. Deze studie levert een aanvullende meting op van hoe mensen kunnen verschillen in het plannen en uitvoeren van werkzaamheden.

In het laatste hoofdstuk van dit proefschrift worden de resultaten van alle studies bediscussieerd en met elkaar in verband gebracht. Dit wordt weergegeven in een geïntegreerd model bestaande uit de antecedenten van timemanagementgedragingen aan de ene kant en de rol van werkkenmerken, het ervaren van controle over de eigen tijd en effecten van timemanagementgedragingen aan de andere kant. Tevens worden de sterkte- en zwaktepunten van deze studies besproken, waaronder het gebruik van verschillende onderzoeksmethoden om timemanagement te onderzoeken en het gebruik van geavanceerde analysetechnieken. Toekomstig onderzoek zou er op gericht moeten zijn om het timemanagementmodel verder te onderzoeken door onder meer andere typen onderzoeksgroepen te gebruiken dan in de studies in dit proefschrift. Tot slot worden praktische implicaties van de uitgevoerde studies beschreven. Voor de praktijk kunnen de resultaten van de studies op meerdere manieren gebruikt worden, bijvoorbeeld voor het aanpassen van bestaande dan wel het opzetten van nieuwe timemanagementtrainingen die gericht zijn op het aanleren van de verschillende typen timemanagementgedrag zoals in dit proefschrift worden gepresenteerd waarvan de effecten wetenschappelijk zijn aangetoond.

Al met al laten de studies in dit proefschrift zien hoe timemanagementgedrag van invloed is op de prestatie en persoonlijk welbevinden van mensen op het werk. Tevens demonstreren zij dat de mate waarin men controle over de eigen tijd ervaart belangrijk is in dit proces. Daarnaast draagt het proefschrift bij aan het inzicht in de rol van individuele verschillen in het plannen en uitvoeren van werkzaamheden. Een beter inzicht in timemanagementgedrag en de effecten kunnen worden gebruikt om maatregelen op zowel individueel als organisatieniveau te kunnen nemen om timemanagementgedrag te bevorderen en zodoende de prestatie en effectiviteit en persoonlijk welbevinden in het werk positief te kunnen beïnvloeden.

Reference

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About the author

Brigitte Claessens was born on January 1, 1974 in Eindhoven, the Netherlands. In 1993 she received her Athenaeum diploma from Eckart College in Eindhoven, after which she started her Psychology study at Utrecht University. She graduated in 1998 with a Masters degree, majoring in Work, Health, and Organisational Psychology. From 1998 to 2000, she worked as an industrial psychologist at a Health and Safety organization. Since 2000, she worked on her PhD at the Technische Universiteit Eindhoven, Beta Research School, as a member of the Human Performance Management Group. This dissertation is the result of her PhD and examines how individuals manage their time at work.

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