Things to Do Today . . . : A Daily Diary Study on Task Completion at Work

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Relatively little is known about how goals in complex jobs are translated into action and how they are completed in real life settings. This study addressed the question to what extent planned work may actually be completed on a daily basis. The completion of daily work goals was studied in a sample of 878 tasks identified by 29 R&D engineers with the help of a daily diary. Multilevel analysis was used to analyse the joint effect of task attributes, perceived job characteristics, and personality attributes on the completion of planned work goals. At the level of task attributes, we found that priority, urgency, and lower importance were related to task completion, and at the individual level, conscientiousness, emotional stability, and time management training. Task completion was not related to task attractiveness, workload, job autonomy, planning, or perceived control of time.

On connaît relativement peu de choses sur la manière dont les objectifs dans des tâches complexes sont traduites en action et sur la manière dont elles sont accomplies dans le cadre de la vie quotidienne. Cette étude a abordé la question de savoir dans quelle mesure les travaux prévus peuvent être effectivement achevés dans la vie quotidienne. Pour ce faire, un échantillon de 878 tâches a été identifié par 29 ingénieurs R&D à l'aide d'un journal quotidien. Une analyse multi niveau a été réalisée pour étudier l'effet conjoint des caractéristiques de la tâche et des caractéristiques de la personnalité sur l'accomplissement des

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objectifs d'un travail planifié. Au niveau des caractéristiques de la tâche, nous trouvons que l'accomplissement de la tâche est lié à la priorité, l'urgence et une importance basse et au niveau individuel à la conscience, la stabilité émotionnelle et à la gestion du temps. L'accomplissement de la tâche n'est pas lié à son attrait, à la charge de travail, à l'autonomie au travail ou au contrôle du temps perçu.

INTRODUCTION

There is an extensive literature on how managers can influence the motivation and performance of employees by means of goal setting (e.g. Locke & Latham, 1990; Latham & Pinder, 2005), but little is known about how employees set work goals for themselves, and how these goals are translated into actions on a daily basis. At present, many organisations provide employees with general work goals that can be broken down and executed in a multitude of ways. This is especially true for professionals in autonomous jobs, who enjoy significant degrees of freedom in planning and executing their daily work goals.

Research on "time management" has provided insight into general strategies to deal with multiple goals under time constraints, the general effectiveness of broadly defined time management skills, participation in time management training, and the use of planning (Claessens, van Eerde, Rutte, & Roe, 2007). However, as far as we are aware, planning and completion at the level of daily work goals has not yet been investigated. This study adds to the literature on time management by investigating daily work goals and their completion.

Theoretical Background

The way in which people handle multiple work goals under time constraints has been the subject of research on "time management". While there is an extensive popular literature on time management (Covey, 1994; Mackenzie, 1972), academic research in this area has been limited (Claessens et al., 2007). Time management is a particular form of self-management—that is, a conscious form of self-regulation (cf. Kuhl & Fuhrmann, 1998)—with a focus on time (Claessens, Roe, & Rutte, 2009). Four types of process may be distinguished in self-regulation (Vancouver & Day, 2005): goal establishment (adopting, adapting, or rejecting a goal); planning (preparing to pursue a goal); striving (moving toward or maintaining a goal); and revision (possible change or disengagement from a goal). Here we focus on planning in particular. We assume that daily work goals are established at the beginning of the day and planned according to different goal properties which we will call task attributes. Striving and revision may occur during the day, but here we seek to establish how planning may be related to the completion of work

at the end of the workday. Before presenting our hypotheses, we will first describe planning and completion in more detail.

Planning.   Planning has been described as a set of mental and behavioral operations that bring together cognitive, emotional, and motivational resources in the service of reaching desired goals (Friedman & Scholnick, 1997; Hacker, 1998). In complex jobs, planning involves making decisions about which goals to perform, how to prioritise them, and how to cope with distractions when carrying them out under time constraints (Claessens, van Eerde, Rutte, & Roe, 2004). Research has investigated specific aspects of planning such as the estimation of task duration times (Burt & Kemp, 1994)—more specifically, the tendency to underestimate the time to complete tasks ("planning fallacy"; Koole & van't Spijker, 2000; Newby-Clark, Ross, Buehler, Koehler, & Griffin, 2000)—and the relationship between individual and team planning, and performance (Locke, Durham, Poon, & Weldon, 1997).

A central assumption in action regulation theory (Frese & Zapf, 1994; Hacker, 1998) is that planning is a prerequisite for successful action. This theory posits that any goal-directed action implies a preparatory phase during which goals are set and an action plan is formed. The action plan is the origin of the intention to carry out the action (Gollwitzer, 1999) and it serves as a mental model for the way in which it is executed. Action plans direct attention and effort to the appropriate actions and thereby facilitate their successful execution. Planning has not only a preparatory function, it also provides a "volitional benefit". It is helpful to the timely and appropriate initiation of goal-directed action, as well as to persistence in the action and to the decision on when it is appropriate to end the action. Planning also helps to protect active intentions from interference from competing intentions, and to prevent distractions by off-task information (Diefendorff & Lord, 2003; Earley & Perry, 1987; Gollwitzer, 1999).

In the case of multiple goals that need to be attained, the integration of several action plans is required, and the prioritisation of actions is needed. Prioritisation provides guidance in the fulfillment of goals because it involves decisions on when action plans have to be initiated. When the work allows for a great degree of freedom for this kind of integrated planning, several types of plan may result. The actual planning process and the prioritisation that results from it may differ in various ways. Individuals may differ in the way in which they prioritise actions with varying degrees of importance, urgency, and attractiveness. Prioritisation may also depend on the work strategy a person chooses to attain an optimal balance between work outcomes and invested effort (Battmann, 1984).

Completion.   The focal construct in our study is completion of daily work goals. Rather than a general performance construct (Roe, 1999b) that

comprises various facets of the job and lacks specific time parameters, we chose to study performance at the level of the work that should be completed within a single workday. Performance then refers to the degree to which the work goals that are set at the start of the day, derived from more general tasks, are in fact completed in the course of the day.

In everyday work settings, people do not always complete their planned tasks. In this study, we focused on three possible factors why this may or may not be the case. First, we investigated planning, in particular, how perceived task attributes may be related to the completion of the tasks. Second, we examined whether characteristics of the job would be related to the completion. Here, aspects of the job may differ, such as workload, that would explain the difference in completion of different tasks. Third, we looked at characteristics of the person. Both personality and competence might play a role in task completion. In the following, we will introduce our hypotheses regarding these three factors.

Task Attributes and Task Completion

One of the aspects likely to be related to completion is the degree of attraction or aversion that an individual feels toward the goal, or goal valence (cf. Frese & Zapf, 1994, p. 276). We assume that a higher positive valence of an activity implies a higher likelihood of completion. Two interpretations of valence may be distinguished, consistent with the use of the concept in expectancy theory of motivation (cf. Van Eerde & Thierry, 1996, p. 576). In some studies, valence has been viewed as referring to a rational-cognitive orientation towards an outcome, i.e. importance. In other studies, it has been interpreted as referring to the affective orientation, as desirability or attractiveness. In other words, valence may be influenced by the extent to which individuals consider the activities relevant to their work output (importance), and to what extent they find the activities intrinsically satisfying (attractiveness). In addition, because we were interested in studying task completion in relatively short time spans, we consider time-related aspects. We considered two aspects: (1) priority, the sequence of the activities in time; and (2) urgency, the extent to which it is relevant to engage in these activities as soon as possible.

Importance of the Task.   According to time management principles, the norm is to complete important tasks, or those that are most relevant to job outcomes (Covey, Merill, & Merill, 1994). Typically, the importance of a task is determined by how important a supervisor considers it to be. In order to perform effectively, it is necessary to consider what is important to accomplish in the job, and to focus attention on these aspects. This consideration helps to make selective choices when there are more tasks than can possibly be completed during the day. This idea is stated in the following hypothesis:

Hypothesis 1a: The perceived importance of tasks at the start of the day is positively related to the percentage of planned tasks completed at the end of the day.

Attractiveness of the Task. As stated above, tasks may also vary in the degree to which individuals like them. The affect people associate with tasks may play an important role in their completion; for example, calling a nice colleague may be a more attractive option than finishing a complex financial duty, and may therefore be completed first. Research on procrastination has shown that unpleasant tasks, tasks appraised as unpleasant, stressful, and difficult, were associated with procrastination, whereas pleasant tasks were not (Pychyl, Lee, Thibodeau, & Blunt, 2000). Unattractive tasks were associated with feelings such as boredom, frustration, and resentment (Blunt & Pychyl, 2000) and were more likely to be delayed. Pleasant tasks are more likely to be completed than unpleasant tasks, other things being equal. On the basis of the foregoing we come to the following hypothesis:

Hypothesis 1b: The perceived attractiveness of tasks at the start of the day is positively related to the percentage of planned tasks completed at the end of the day.

Priority of the Task. We assume that assigned priority will be related to task completion through an effect on decision making. When multiple tasks need to be performed within a certain time frame, decisions need to be made on what to do first and what to do later. In other words, there is a need to prioritise. Prioritising is a component of planning and refers to the determination of the sequence in which the planned tasks will be executed. In general, priorities establish a relation to a goal, so that the actions that may come up during a day may be judged in terms of executing them now or later in order to reach the goal. Relatively little is known about how people prioritise tasks and how priority affects task completion. The likelihood that tasks will be completed would appear to be greater when their sequence has been planned. Indirect evidence on a link between priority and performance comes from research on implementation intentions (Gollwitzer, 1999; Gollwitzer & Sheeran, 2004) that has shown that the more concretely actions are planned in terms of when, where, and how to execute them, the more likely it becomes that they actually will be executed. Tripoli (1998) reported higher supervisor ratings for employees with a high priority focus, which suggests a more effective completion of tasks. This led to the formulation of the third hypothesis to be tested:

Hypothesis 1c: The priority assigned to tasks at the start of the day is positively related to the percentage of planned tasks completed at the end of the day.

Urgency of the Task. Theoretically, there are reasons to assume that a strong effect is produced by the second time-related aspect: urgency. First,

people may act on urgent tasks because of positive reinforcement through feedback on performance (Ashford & Northcraft, 2003). The anticipated positive outcomes of completing an urgent task may be very strong because of the immediate reactions of others who may be dependent on the execution of the task. A second reason is that urgent tasks may produce a recency effect (cf. Hintzman, 2004). Focusing on upcoming tasks comes more easily than remembering tasks that originated in the past. The past reasons for performing the tasks may have lost some relevance in the current situation or may have been overshadowed by distractions. Third, there is the tendency of "time discounting" (Koch & Kleinmann, 2002; König & Kleinmann, 2005; König & Kleinmann, 2007), i.e. the phenomenon that individuals perceive later gains as less valuable than immediate gains. When given a choice between two equally attractive options over time, individuals tend to choose the option that is closest in time because the subjective value of an outcome decreases as the delay to its receipt increases. These considerations led to the following hypothesis:

> *Hypothesis 1d*: The perceived urgency of tasks at the start of the day is positively related to the percentage of planned tasks completed at the end of the day.

Job Attributes and Task Completion

In general, the popular time management literature (e.g. Covey, 1994) ignores the role of job design and the organisation in which the individual works. As such, it holds a rather optimistic view on how individuals may be able to gain control over their work, no matter how the work is structured or which norms are abided by in the work context. So far, some studies on time management have addressed issues such as work–family balance and supervisory behavior (Burt & Forsyth, 2001; Jex & Elacqua, 1999), but variables related to work content have not been studied. Yet, the literature on work performance (e.g. Roe, 1999b) suggests that there are a number of factors that are likely to be related to the completion of tasks. Here, we consider workload and autonomy.

Workload. Although a high workload may lead to an increase in compensatory effort, it is generally associated with lower performance (Hockey, 1997). Although this reasoning is straightforward, this relation has not been tested in daily tasks, as far as we know. This leads to the following hypothesis:

> *Hypothesis 2*: The lower the workload, the higher will be the percentage of planned tasks completed at the end of the workday.

Autonomy. Autonomy has been shown to be positively related to job performance (Langfred & Moye, 2004; Roe, 1999b). A high degree of autonomy implies more discretion to plan the tasks according to personal preferences and responsibilities, which makes it more likely that tasks will be completed as planned. This leads to the following hypothesis:

Hypothesis 3: The higher the job autonomy, the higher will be the percentage of planned tasks completed at the end of the day.

Personality and Task Completion

Personality traits of the employees may also be related to the completion of work as planned. Here, we consider two factors of the Big Five Factor model of personality, conscientiousness and emotional stability.

Conscientiousness. The level of dedication and effort may differ strongly between individuals. A strong effect of Conscientiousness on task completion may be expected, because this factor encompasses tendencies such as order, dutifulness, discipline, task focus, and achievement motivation. Conscientiousness is positively related to job performance (Barrick, Mount, & Judge, 2001; Judge & Bono, 2001; Liao & Chuang, 2004) and negatively related to procrastination (Van Eerde, 2003). Employees high on Conscientiousness are therefore expected to complete more planned tasks, as they feel committed to do what they have promised to do, to avoid distractions, and to deal effectively with interruptions.

Hypothesis 4: Conscientiousness is positively related to the percentage of daily planned tasks completed at the end of the day.

Emotional Stability. Another trait that has been identified as positively related to job performance is emotional stability (Barrick et al., 2001; Judge & Bono, 2001; Roe, 1999b). Emotional stability is somewhat negatively related to procrastination (Van Eerde, 2003). Highly emotionally stable employees are expected to be effective in overcoming obstacles as a result of using better problem solving strategies. Being able to deal with one's emotions will help to stay focused in the completion of planned tasks.

Hypothesis 5: Emotional stability is positively related to the percentage of planned tasks completed at the end of the day.

Time Management Competence and Task Completion

The completion of tasks may also depend on individual competence in self-management with regard to time. As such, setting goals, deciding

about the importance of goals, planning, executing goal-oriented actions, and evaluating outcomes of actions may be considered aspects of time management competence. The motivation to pursue a goal depends on volitional competences and strategies (Kuhl & Fuhrmann, 1998), and to some extent these may be learned. Particularly relevant with regard to time are principles of prioritising and planning, and how to stay on track in pursuing actions and to overcome the temptation of giving in to distractions. While time management training in general may enhance time management competence, we consider two more aspects in more detail that may point to differences in time-related competences: planning and control of time.

Time Management Training.   Time management training (Drucker, 1967) has been introduced as a means to enhance self-management. In time management training participants learn how to prioritise and plan tasks, to identify time wasters, and ways to deal with these. Emphasis is placed on spending more time on important activities, and less time on less important activities, for example, by routinising or delegating tasks. Despite its popularity among professionals, evidence on the effects of time management training is limited (Claessens et al., 2007). The overall evaluation of most participants is positive, and there is some support for the claim that time management affects job performance positively. Criticism on time management training concerns the neglect of how the context is structured, and the fact that volition is not trained explicitly. That is, planning and structuring one's activities may not be enough to protect intentions from other influences. Other volitional strategies may be needed, such as ways to find meaning in tasks and making them more fun (Kuhl & Fuhrmann, 1998).

Notwithstanding the critique, daily task completion can be assumed to be affected by time management training, because successful task completion is one of its central aims. This idea is stated in the following hypothesis:

Hypothesis 6: Prior training in time management is positively related to the percentage of planned tasks completed at the end of the day.

Planning.   Those who are more inclined to plan in general may have more insight into the time demands of the planned tasks and can therefore be expected to plan more realistically, as well as to anticipate potential obstacles (Frese, Stewart, & Hannover, 1987; Tripoli, 1998). We expect that general planning is related to planned task completion.

Hypothesis 7: Planning is positively related to the completion of the percentage of planned tasks at the end of the day.

Control of Time. The concept control of time was introduced by Macan (1994). She proposed a model of time management in which control of time mediated the relation between setting goals and priorities (planning) and outcomes such as performance, tension, and satisfaction. A higher degree of perceived control of time may lead to planned task completion, because it may reinforce determination and help to reduce anxiety or stress. In the current study, we tested its positive effects on the completion of daily planned tasks, according to the following hypothesis:

Hypothesis 8: Perceived control of time is positively related to the percentage of planned tasks completed at the end of the day.

METHOD

Sample

The participants in this study were 29 R&D engineers working in departments of the Dutch Corporate Headquarters of a world leading company in 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 for major global semiconductor manufacturers to create chips that power a wide array of electronic, communications, and information technology products. Twenty-nine out of 64 engineers (46%) agreed to participate in this study which was part of a larger study on time management at work. Overall, 29 respondents filled out two or more diaries in combination with a questionnaire that was sent out to the participants before the start of this diary study. Most of the respondents were male (83%), were on average 33 years old, and worked full-time with an average of 8.4 hours a day.

Procedure

This study focused on performance within the time frame of a workday. We focused on two levels: the level of daily tasks, and the individual level. A combination of these two levels will provide insight into how prioritisation may lead to daily task completion, taking into account that persons may have different approaches according to their background in terms of job characterics, personality, and training.

Although the engineers did not have daily deadlines, the day is nevertheless a meaningful entity in their job. We designed a daily diary study to investigate the planning and completion of daily tasks.[1] Several weeks before

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[1] One might argue that this diary study was intrusive because all participants were requested to make a to-do list. They may normally not do this and it may not reflect their normal work

commencement of the diary period, each respondent was asked to complete a questionnaire. The daily study consisted of 10 measurements over a period of 5 weeks, during 2 days a week.

This frequency was chosen to avoid the possibility that participating in the study would be too much of a burden, as diary studies need more commitment and dedication from the participants than most other types of data collection (Bolger, Davis, & Rafaeli, 2003). Data were collected with a diary protocol. The respondents were instructed to fill out the diaries on two pre-selected different days of each week to ensure that no bias in particular weekdays would occur. If the selected days were days off, or were spent in an all-day meeting, respondents were requested to select the following day.

Variables in the Questionnaire

Workload was assessed on 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 fast (Van Veldhoven, Meijman, Broersen, & Fortuin, 1997). Responses were made using 4-point scales from "never" (0) to "always" (3). A high score indicates a high workload. Sample item: "Do you need to work fast to finish your work?"

Job Autonomy was assessed with an 11-item scale (Van Veldhoven et al., 1997) indicating 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. Responses were given on a 4-point scale ranging from "never" (0) to "always" (3). A high score indicates high job autonomy. Sample item: "Are you free to execute your work the way you want?" Previous research has demonstrated the psychometric properties of the perceived workload and job autonomy scales (Van Veldhoven, de Jonge, Broersen, Kompier, & Meijman, 2002).

Conscientiousness was assessed with seven items of the Berkeley Personality Profile (Harary & Donahue, 1994) on a 5-point response scale ranging from "do not agree at all" (1) to "completely agree" (5). A high score

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routine. To establish the effect of the use of the diary, we employed a quasi-experimental design. In the diary group, the respondents filled out a pre-questionnaire, completed the daily diaries, and responded to a post-questionnaire. Respondents in the control group only completed pre- and post-questionnaires. Thus, the questionnaires served to collect information on job characteristics and individual differences, but were also used to assess possible changes due to diary keeping. Neither a significant group effect nor a group × time effect was found with respect to workload, autonomy, planning behavior, and perceived control of time. A group effect might have been indicative of self-selection bias into the diary group, and a group × time effect might have been indicative of differential effects according to the conditions over time. In this study, we report on the diary condition only. The complete questionnaire results can be found in Claessens, Van Eerde, Rutte, and Roe (2004).

represents a high preference for conscientiousness. Sample item: "I see myself as someone who handles things efficiently".

Emotional stability was assessed with seven items from 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). A high score indicates high emotional stability. Sample item: "I see myself as someone who worries a lot" (reverse scored).

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.

Planning 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). Long-term goal-setting items were excluded from the scale (Peeters & Rutte, 2005). The remaining items referred to short-term planning and prioritising tasks. One item was replaced with a planning item of the Time Management Questionnaire (Britton & Tesser, 1991). Examples of items are: "I set short-term goals for myself" and "I plan my daily work activities". Responses were made on a scale ranging from "do not agree at all" (1) to "completely agree" (5). A high score indicates more planning behavior.

Perceived control of time: An adapted version of Macan's (1994) control of time was used (Claessens et al., 2004). Ratings were made on a 5-point scale ranging from "do not agree at all" (1) to "completely agree" (5); a high score represents high perceived control of time. A sample item is: "I find it difficult to keep to my schedule because others take me away from my work".

Variables in the Diary Study

Section one: *Start of a working day*: The participants were requested to fill out planned tasks for the day, where we provided the following description: ". . . a list of tasks you would like to execute today. You can use your planner for this."

We requested them to rank the tasks according to priority. Next, the respondents were asked to rate their planned tasks on a 5-point scale (1 = low and 5 = high) on three aspects: (1) urgency ("Should this task be done now or can it be done after today without consequences?"); (2) importance ("How important is it in the eyes of your supervisor?"); and (3) attractiveness ("How attractive or fun do you find it to execute this task?"). In our data analysis, we dichotomised the priority ranks into first priority (1) and second to last priority (0) as people reported different numbers of tasks.

Section two: *End of a working day*: The respondents were requested to indicate the percentage completed of each planned task with the following question: "Please fill out the percentage completed in comparison to what

you wanted to complete today. If it is completed fill out 100%. If the task was not completed, give an estimation of the percentage that was completed." Participants were also asked to note reasons for the noncompletion of tasks. In another section, participants were instructed to add *unplanned* tasks they had performed during the day, with a rating on 5-point scales of the urgency, importance, and attractiveness of these tasks. In addition, they were asked to indicate which *work interruptions* came up during their workday and how much time in minutes these took altogether.

Data Analysis

To test the hypotheses, we took into account that the constructs were measured at different levels, i.e. that of the task (level 1) and that of the individual engineer (level 2). This nested structure violates the assumption of independence that is needed for most methods of analysis (Bryck & Raudenbush, 1992). We therefore used hierarchical linear modeling (Hox, 1995; Klein & Kozlowski, 2000; Snijders & Bosker, 1999) to analyse both levels simultaneously while taking into account the nested data structure. We used MLwiN software to analyse the data (Rasbash, Browne, Goldstein, Yang, Plewis, Healy, Woodhouse, Draper, Langford, & Lewis, 2000).

The percentage of each planned task completed was the dependent variable at the task level. The measures obtained at the two levels (task and individual level) were entered into the models, starting with the simplest possible model, the intercept-only or "empty" model. In the second step, all lower-level explanatory variables (in our case, task-level variables) were entered into the model. The improvement of the model in the second step was tested by computing the fit of this model and comparing it to the fit of 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 explanatory variables (task and individual level) were entered into the model. Again, the global chi-square test was used to test the improvement of the fit. The alpha level used in the hypothesis tests was .05.

The regression weights indicate the relative weight to the dependent variable percentage of the planned task completed. All the effects stated in the hypotheses were tested simultaneously. This provides different insights from the direct effects, indicated by the zero-order correlations.

RESULTS

Descriptive Statistics

In total, the 29 respondents filled out 262 diaries, reporting on 1,130 tasks. The planned tasks were reported at the start of a working day ($n = 878$),

TABLE 1
Intercorrelations of Priority Ranking, Ratings of Importance, Urgency,
Attractiveness, and Percentage of Planned Tasks Completed

	M	SD	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. Completion	72.56	39.77	.21**	.04	.11**	.00	—

$n = 878$ planned tasks. * $p < .05$; ** $p < .01$.

and 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. Examples of planned tasks are: "EDR/1200 project", "Calibrate machine 324", and "Place an order for machine parts". Examples of unplanned tasks are: "Advising co-workers on the selection of software and working procedures in a certain project", "Implementing a name change for a parallel key", and "Discuss the benefit of SEMI E78 qualification".

Intercorrelations of the variables in the daily diary study at the task level are presented in Table 1. Intercorrelations among importance, attractiveness, priority, and urgency were low, except between task urgency and importance ($r = .58$). All correlations were below the generally accepted rule of thumb ($r = .70$) for identifying the risk of multicollinearity (Tabachnick & Fidell, 2001).

In Table 2, the means, standard deviations, alpha coefficients, and inter-correlations among the questionnaire variables are presented. Five respondents had participated in a time management training program 3 to 6 years prior to this study.

Multilevel Analysis

Using multilevel modeling, we tested three models: an intercept-only model (Model A), a model that included task-level variables (Model B), and a model that included both task and individual-level variables (Model C). The results are given in Table 3.

In Model B, the task-level variables were included. The results of Model B indicated a significant change in −2*log likelihood, indicating a significantly improved model. In Model C, both task-level and individual-level variables were included. Model C also revealed a significant difference in −2*log likelihood, implying that inclusion of the individual-level variables resulted in again a significantly improved model.

TABLE 2
Intercorrelations among Questionnaire Variables

	M	SD	*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)

n = 29 individuals. *Note*: TM = time management. Figures in parentheses are coefficients alpha.
* $p < .05$; ** $p < .01$.

In models B and C, we found a significant negative relation between task completion and importance, indicating that less important tasks were more likely to be completed at the end of the workday, whereas Hypothesis 1a stated that there would be a positive relation. We will comment on this finding in the discussion. The attractiveness of the tasks was not related to completion, in contrast to Hypothesis 1b stating that there would be a positive relation.

In accordance with Hypothesis 1c, we found that when participants judged their tasks as having high priority these were more likely to be completed than the tasks judged to be lower in priority. The regression weight of urgency was significantly positive, as stated in Hypothesis 1d. Each increase in one point on the urgency scale led on average to a 5% rise in task completion.

Based on the results of Model C, Hypotheses 2 and 3, stating that workload and autonomy would be related to task completion, were rejected as the effects were non-significant. However, Hypotheses 4 and 5 were confirmed: respondents who were more conscientious and emotionally stable had completed a higher percentage of the planned tasks. Also, those who had participated in a time management program prior to this study completed more of their planned work, as we hypothesised (Hypothesis 6). Planning (Hypothesis 7) and perceived control of time (Hypothesis 8) were not significantly related to task completion.

Additional Analyses

Noncompletion of Planned Tasks.   On average, 73% of each of the planned tasks were completed by the end of a workday. Reasons mentioned for not completing planned tasks were: no time (e.g. because start-up time was too long: 42%); unplanned tasks that came up (18%); being interrupted by others (17%); and other reasons (23%). The diaries also revealed that unplanned tasks and work interruptions consisted of telephone calls (31%); colleagues walking

TABLE 3
Multilevel Analysis of Results of Planned Task Completion

	Model A	Model B	Model C	Effect size β	H
			Fixed part[a]		
Intercept (γ00)	72.277 (2.412)	66.407 (6.084)	62.232 (5.867)		
Task-level coefficients					
Task importance (γ10)		−5.732 (1.826)*	−5.704 (1.857)*	−.12	1a
Task attractiveness (γ20)		0.936 (1.482)	1.134 (1.523)	.03	1b
Priority (γ30)		5.743 (1.104)*	5.922 (1.120)*		1c
Task urgency (γ40)		5.161 (1.616)*	5.179 (1.643)*	.13	1d
Individual-level coefficients					
Workload (γ01)			−7.828 (7.890)	−.08	2
Job autonomy (γ02)			−5.683 (6.188)	−.05	3
Conscientiousness (γ03)			8.389 (4.171)*	.11	4
Emotional stability (γ04)			10.391 (3.817)*	.13	5
Time management training (γ05)			16.414 (4.967)*		6
Planning behavior (γ06)			5.187 (4.949)	.06	7
Perceived control of time (γ07)			4.189 (3.563)	.09	8
			Random part		
σe0² (task-level variance)	1474.244 (74.624)	1423.836 (70.057)	1421.530 (73.169)		
σu0² (individual-level variance)	104.64 (43.232)	104.255 (44.668)	50.972 (28.261)		
			Model fit		
−2*log likelihood (IGLS)	8218.09	8170.11	7889.42		
Δ−2*log likelihood		47.98	280.69		
Δdf		4	7		
Explained variance (%)					
Task-level		25.4%	28.2%		
Individual-level			53.8%		

Notes: H = hypothesis number; Effect sizes (β-coefficients) for priority and time management training cannot be calculated as they are dichotomous variables.
* $p < 0.05$; ** $p < 0.01$.
[a] Unstandardised regression coefficients presented under models A, B, and C.
Standard errors between parentheses.

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 in a day, which was almost 20% of their total work time, with a maximum of 300 minutes.

Planned and Unplanned Tasks.   Additional results showed that, when compared to planned tasks, a greater part (higher percentage) of the unplanned tasks was completed by the end of a workday ($m_{unplanned} = 81.23$ vs. $m_{planned} = 72.56$, $t = 2.98$, $p < .01$). Furthermore, unplanned tasks were judged as more urgent ($m_{unplanned} = 4.15$ vs. $m_{planned} = 3.93$, $t = 4.79$, $p < .001$) and more important ($m_{unplanned} = 3.93$ vs. $m_{planned} = 3.53$, $t = 3.50$, $p < .001$) than planned tasks, and equally attractive ($m_{unplanned} = 3.37$ vs. $m_{planned} = 3.43$, $t = -.69$, ns).

DISCUSSION

The aim of our study was to investigate how task attributes, job characteristics, personality characteristics, and time management competence were related to the completion of planned daily tasks. We found effects of task attributes, personality, and time management competence.

The results relating to our hypotheses concerning the task attributes were in the expected direction except for attractiveness and importance; attractiveness was not related to completion, and importance was negatively related. Attractiveness was not related to task completion, and this leads us to conclude that all things being equal, anticipated affective outcomes did not explain additional variance in task completion in this sample. In contrast to what we expected, we found that less important tasks rather than more important tasks were completed. There was no direct relation between importance and task completion, but the relative weight, taking into account the other variables, revealed a negative relation. This seems to be a suppressor effect that can be interpreted in the following way: tasks that are both important and urgent are more likely to be performed, but tasks that are only important and not urgent are unlikely to be completed. This aspect is important to investigate further in future research.

As expected, high priority and urgent tasks were more likely to be completed at the end of the workday. This was predicted by theory and was compatible with the idea put forward in the popular time management literature (Covey, 1994). More specifically, it is in accordance with the time discounting paradigm (Koch & Kleinmann, 2002; König & Kleinmann, 2007), and the recency effect (Hintzman, 2004).

Workload and job autonomy were not related to task completion. Possibly, the jobs were not sufficiently different to reveal any relation. This

argument is supported by the low variance on these variables. Also, the measurement may have been too global for our dependent variable planned task completion. Experienced daily time pressure rather than overall workload may be a better indicator for the dependent variable task completion.

Personality—conscientiousness and emotional stability—and time management skills, rather than planning style or control of time, were found to be related to task completion at the individual level. This finding is in line with previous studies on personality predictors of performance and performance motivation (Barrick et al., 2001; Roe, 1999b). It is also in line with the idea that self-regulation of attention and emotion helps to overcome impulsive reactions (Kuhl, 1992; Shoda, Mischel, & Peake, 1990). The expected positive relations between planning and control of time on the one hand and task completion on the other hand were not found. Conceptually, an overlap with the personality variable conscientiousness can be assumed. However, in this sample, the correlations between planning, perceived control, and conscientiousness were low. It may be the case that planning is part of the engineering job, and as such, does not show much variance in this sample.

Time management training was most highly related to task completion of the variables included, even though only five people reported having gone through a program, and that was more than three years before. This finding implies a positive effect of the training, in line with the overall findings on time management training (Claessens et al., 2007). The strong relation may be attributed to the fact that daily task completion is a more proximal outcome of time management than overall performance, which was often used as the dependent variable in previous studies.

Our additional exploration of the data revealed that unplanned tasks were rated as more urgent and important and that these were completed to a higher degree than planned tasks. Again, these results are in line with recency and time discounting explanations. Time discounting is a critical component in motivated behavior and the phenomenon is supported by psychobiological findings (Steel & König, 2006). As such, it may be hard to change. Skills acquired in early childhood may help in overcoming it (Shoda et al., 1990), but training these skills at a later age appears to be difficult. Some of the popular time management advice about completing tasks is to decrease the level of abstraction of future goals by establishing subgoals that are more concrete and time specific. Concrete action plans that specify when, where, and how to act, so-called implementation intentions (Gollwitzer, 1999), have been shown to debias the planning fallacy, i.e. biased planning based on overly optimistic task completion times caused by a narrow focus on successful future plans. Implementation intentions caused the rate of completion to increase and the number of interruptions to decrease (Koole & van't Spijker, 2000).

Another approach that may be taken to increase awareness of time discounting is by training implementation intentions as simple if–then rules in particular situations, for example using the simple rule that when "involved in concentrated work and someone walks in unexpectedly" then "answer politely, but make an appointment to discuss it later". Similar rules that may reduce distractions may also be implemented for a work team at regular times, such as quiet time in which time is reserved for individual work (cf. Perlow, 1999). Another solution offered in time management is to make use of an explicit decision scheme by importance and urgency and to constantly remind oneself of the importance of tasks with this scheme.

This study adds to the literature on planning and time management. A strong point is the use of daily diaries, which gives insight into self-management processes at task level in addition to the individual level. This helps to fill the void on knowledge of the implementation of goals in shorter time intervals. As Daniels and Harris (2005) stated, a diary method is particularly useful for investigating dynamic processes and minimises measurement error as measures are taken close to the time that they are actually experienced. Another strong point is the use of the percentage of task completion per day as a precise measure of performance. Many time discounting studies have used preference or choice as the dependent variable, rather than actions (cf. König & Kleinmann, 2005). A further strength of the study is the inclusion of work characteristics and individual differences in the area of time management. Finally, using multilevel analysis we were able to assess the relations of tasks attributes and individual characteristics to task completion simultaneously and to assess the relative effect sizes at each level.

There are some limitations to the current study, such as a rather small number of participants in the sample. Particularly, the low power at this level of analysis may have led to non-significant findings that should be interpreted with caution.

One of the limitations in the interpretation may lie in the instructions to make a daily to-do list. It may be that task completion was influenced by these instructions and that a higher rate of completion may have been achieved purely because of this list. Some persons may normally not make to-do lists, and this may have resulted in a restriction in variation of task completion in comparison to an unrestricted way of working. Further studies may assess whether there are differences in task completion between conditions with or without previous planning.

Another concern relates to the validity of self-report data with well-known shortcomings (cf. Crampton & Wagner, 1994), but a strong point is that unlike other studies, this study used a diary that asked for highly specific job-related activities.

Perhaps the variable priority may be viewed with some caution: when a person judges the priority of one task over other tasks, the answers are

dependent, which violates the assumption of independence needed statistically. We do not view this as a major problem, but suggest that this be addressed in future research.

The 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 was not be representative for other workdays, for example in another season. Also, there may possibly be limited generalisability to other samples and organisational settings. Research is needed to determine the extent to which the present findings generalise to other work situations.

Many interesting avenues for future research on task completion are still open. For example, little is known about how people switch between tasks, change the order according to changing circumstances, delay tasks, or abandon them altogether (Roe, 1999a; Kirchberg, Roe, & Van Eerde, 2008). Other designs may be used, such as sampling several random intervals on a day (cf. Bolger et al., 2003), which may provide additional insight into task completion. On the other hand, the beginning and ending of a workday appear to be natural points in time for responding, and thus are perhaps less intrusive than responses at random intervals. Other independent variables may be used, such as expectancy and self-efficacy, which are also likely to affect planned task completion (cf. Holman, Totterdell, & Rogelberg, 2003). Other dependent variables may also be interesting to assess, such as the duration of activities (Newman, 2004).

In conclusion, this study shows that task completion was related to the assigned priority and urgency. No direct effect of importance on task completion was found, and the role of importance in combination with other variables needs to be investigated further. The attractiveness of the tasks was not related to their completion. In addition, time management skills and personality (conscientiousness and emotional stability) were predictive of daily task completion. Overall, more variance was explained by individual-level variables—personality and time management skills—than by task-level variables. Most variance was explained by whether individuals had attended time management training in the past. This may give an optimistic message to many who struggle with the unsatisfying experience that work is never finished. At least on a daily basis, work can be finished, and training time management skills can help to achieve it.

REFERENCES

Ashford, S.J., & Northcraft, G. (2003). Robbing Peter to pay Paul: Feedback environments and enacted priorities in response to competing task demands. *Human Resource Management Review*, *13*, 537–559.

Barrick, M.R., Mount, M.K., & Judge, T.A. (2001). Personality and performance at the beginning of the new millennium: What do we know and where do we go next? *International Journal of Selection and Assessment*, *9*, 9–30.

Battmann, W. (1984). Regulation und fehlregulation im verhalten. ix. Entlastung und belastung durch planung [Straining and relieving effects of planning]. *Psychologische Beiträge*, *26*, 672–692.

Blunt, A.K., & Pychyl, T.A. (2000). Task aversiveness and procrastination: A multi-dimensional approach to task aversiveness across stages of personal projects. *Personality and Individual Differences*, *28*, 153–167.

Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: Capturing life as it is lived. *Annual Review of Psychology*, *54*, 579–616.

Britton, B.K., & Tesser, A. (1991). Effects of time-management practices on college grades. *Journal of Educational Psychology*, *83*, 405–410.

Bryck, A.S., & Raudenbush, S.W. (1992). *Hierarchical linear models*. Thousand Oaks, CA: Sage Publications.

Burt, C.D.B., & Forsyth, D.K. (2001). Relationships between supervisor behavior, family support and perceived time management ability. *New Zealand Journal of Psychology*, *30*, 4–8.

Burt, C.D.B., & Kemp, S. (1994). Construction of activity duration and time management potential. *Applied Cognitive Psychology*, *8*, 155–168.

Claessens, B.J.C., Van Eerde, W., Rutte, C.G., & Roe, R.A. (2004). Planning behavior and perceived control of time at work. *Journal of Organizational Behavior*, *25*, 937–950.

Claessens, B.J.C., Van Eerde, W., Rutte, C.G., & Roe, R.A. (2007). A review of the time management literature. *Personnel Review*, *36*, 255–276.

Claessens, B.J.C., Roe, R.A., & Rutte, C.G. (2009). Time management: Logic, effectiveness and challenges. In R.A. Roe, M.J. Waller, & S.R. Clegg (Eds.), *Time in organizational research*. London: Routledge.

Covey, S.R. (1994). *The seven habits of highly effective people: Restoring the character ethic*. London: Simon & Schuster.

Covey, S., Merill, R., & Merill, R. (1994). *First things first*. New York: Simon & Schuster.

Crampton, S.M., & Wagner, J.A. (1994). Percept-percept inflation in micro-organizational research: An investigation of prevalence and effect. *Journal of Applied Psychology*, *79*, 67–76.

Daniels, K., & Harris, C. (2005). A daily diary study of coping in the context of the job demands–control–support model. *Journal of Vocational Behavior*, *66*, 219–237.

Diefendorff, J.M., & Lord, R.G. (2003). The volitional and strategic effects of planning on task performance and goal commitment. *Human Performance*, *16*, 365–387.

Drucker, P.F. (1967). *The effective executive*. New York: Harper & Row.

Earley, P.C., & Perry, B.C. (1987). Work plan availability and performance: An assessment of task strategy priming on subsequent task completion. *Organizational Behavior and Human Decision Processes*, *39*, 279–302.

Frese, M.D., & Zapf, D. (1994). Action as the core of work psychology: A German approach. In H.C. Triandis, M.D. Dunnette, & L.M. Hough (Eds.), *Handbook of*

industrial and organizational psychology (vol. 4, pp. 271–340). Palo Alto, CA: Consulting Psychologists Press.

Frese, M., Stewart, J., & Hannover, B. (1987). Goal orientation and planfulness: Action styles as personality concepts. *Journal of Personality and Social Psychology*, *52*, 1182–1194.

Friedman, S.L., & Scholnick, E.K. (1997). *The developmental psychology of planning: Why, how, and when do we plan?* Mahwah, NJ: Lawrence Erlbaum Associates.

Gollwitzer, P.M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist*, *54*, 493–503.

Gollwitzer, P.M., & Sheeran, P. (2004). Implementation intentions and goal achievement: A meta-analysis of effects and processes. Working paper.

Hacker, W. (1998). *Allgemeine Arbetspsychologie: Psychische regulation vorn Arbeitstätigkeiten*. [General work psychology: Psychological regulation of work activities]. Bern: Huber.

Harary, K., & Donahue, E. (1994). Ontdek de vele facetten van uw persoonlijkheid [Discover the many facets of your personality]. *Psychologie*, *13*, 10–13.

Hintzman, D.L. (2004). Time versus items in judgment of recency. *Memory & Cognition*, *32*, 1298–1304.

Hockey, G.J. (1997). Compensatory control in the regulation of human performance under stress and high workload: A cognitive-energetical framework. *Biological Psychology*, *45*(1–3), 73–93.

Holman, D.J., Totterdell, P., & Rogelberg, S.G. (2003). A daily diary study of goal-striving: The relationship between goal velocity, affect, expectancies and effort, *XI European Congress on Work and Organizational Psychology, EAWOP*. Lisbon, Portugal.

Hox, J.J. (1995). *Applied multilevel analysis*. Amsterdam: TT-Publikaties.

Jex, S.M., & Elacqua, T.C. (1999). Time management as a moderator of relations between stressors and employee strain, *Work and Stress*, *13*, 182–191.

Judge, T.A., & Bono, J.E. (2001). Relationships of core self-evaluations traits—self-esteem, generalized self-efficacy, locus of control, and emotional stability—with job satisfaction and job performance: A meta-analysis. *Journal of Applied Psychology*, *86*, 80–92

Kirchberg, D.M., Roe, R.A., & Van Eerde, W. (2008). Multiple goal management: A dynamic within-person approach to work motivation. Paper presented at the Academy of Management, Anaheim, CA, 8–13 August 2008.

Klein, K.J., & Kozlowski, S.W.J. (2000). *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions*. San Francisco, CA: Jossey-Bass.

Koch, C.J., & Kleinmann, M. (2002). A stitch in time saves nine: Behavioural decision-making explanations for time management problems. *European Journal of Work and Organizational Psychology*, *11*, 199–217.

König, C.J., & Kleinmann, M. (2005). Deadline rush: A time management phenomenon and its mathematical description. *Journal of Psychology*, *139*, 33–45.

König, C.J., & Kleinmann, M. (2007). Time management problems and discounted utility. *The Journal of Psychology*, *141*, 321–334.

Koole, S., & van't Spijker, M. (2000). Overcoming the planning fallacy through willpower: Effects of implementation intentions on actual and predicted task-completion times. *European Journal of Social Psychology*, 30, 873–888.

Kuhl, J. (1992). A theory of self-regulation—action versus state orientation, self-discrimination, and some applications. *Applied Psychology: An International Review/Psychologie Appliquee: Revue Internationale*, 41, 97–129.

Kuhl, J., & Fuhrmann, A. (1998). Decomposing self-regulation and self-control: The volitional components inventory. In C.S. Dweck (Ed.), *Motivation and self-regulation across the life-span* (pp. 15–49). Cambridge: Cambridge University Press.

Langfred, C.W., & Moye, N.A. (2004). Effects of task autonomy on performance: An extended model considering motivational, informational, and structural mechanisms. *Journal of Applied Psychology*, 89, 934–945.

Latham, G.P., & Pinder, C.C. (2005). Work motivation theory and research at the dawn of the twenty-first century. *Annual Review of Psychology*, 56, 485–516.

Liao, H., & Chuang, A. (2004). A multilevel investigation of factors influencing employee service performance and customer outcomes. *Academy of Management Journal*, 47, 41–58.

Locke, E.A., Durham, C.C., Poon, J.M.L., & Weldon, E. (1997). Goal setting, planning, and performance on work tasks for individuals and groups. In S.L. Friedman & E.K. Scholnick (Eds.), *The developmental psychology of planning: Why, how, and when do we plan?* (pp. 239–262). Mahwah, NJ: Lawrence Erlbaum Associates.

Locke, E.A., & Latham, G.P. (1990). *A theory of goal setting and task performance*. Englewood Cliffs, NJ: Prentice Hall.

Macan, T.H. (1994). Time management: Test of a process model. *Journal of Applied Psychology*, 79, 381–391.

Macan, T.H., Shahani, C., Dipboye, R.L., & Philips, A.P. (1990). College students' time management: Correlations with academic performance and stress. *Journal of Educational Psychology*, 82, 760–768.

Mackenzie, R.A. (1972). *The time trap: Managing your way out*. New York: Amacom.

Newby-Clark, I.R., Ross, M., Buehler, R., Koehler, D.J., & Griffin, D. (2000). People focus on optimistic scenarios and disregard pessimistic scenarios while predicting task completion times. *Journal of Experimental Psychology*, 3, 171–182.

Newman, W.M. (2004). Busy days: Exposing temporal metrics, structures and problems through diary studies. Paper presented at Computer Human Interaction, 2004; http://www.cs.bath.ac.uk/~pwild/TICKS/chi-2004-workshop/Papers/Newman.pdf.

Peeters, M.A.G., & Rutte, C.G. (2005). Time management behavior as a moderator for the job demand–control interaction. *Journal of Occupational Health Psychology*, 10, 64–75.

Perlow, L.A. (1999). The time famine: Toward a sociology of work time. *Administrative Science Quarterly*, 44, 57–81.

Pychyl, T.A., Lee, J.M., Thibodeau, R., & Blunt, A. (2000). Five days of emotion: An experience sampling study of undergraduate student procrastination. *Journal of Social Behavior and Personality*, 15, 239–254.

Rasbash, J., Browne, W., Goldstein, H., Yang, M., Plewis, I., Healy, M., Woodhouse, G., Draper, D., Langford, I., & Lewis, T. (2000). *A user's guide to MLwiN*. London: Multilevel Models Project Institute of Education, University of London.

Roe, R.A. (1999a). The calendar model: Towards a less parsimonious but more realistic model of work motivation. Paper presented at the 9th European Congress of Work & Organizational Psychology, Espoo-Helsinki, Finland, 12–15 May, Tilburg: Work & Organization Research Center, Tilburg University. WORC Paper 99.05.009/4.

Roe, R. (1999b). Work performance: A multiple regulation perspective. *International Review of Industrial and Organizational Psychology*, *14*, 231–335.

Shoda, Y., Mischel, W., & Peake, P.K. (1990). Predicting adolescent cognitive and self-regulatory competences from preschool delay of gratification—identifying diagnostic conditions. *Developmental Psychology*, *26*, 978–986.

Snijders, T.A.B., & Bosker, R.J. (1999). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. London: Sage Publications.

Steel, P., & König, C. (2006). Integrating theories of motivation. *Academy of Management Review*, *31*, 889–913.

Tabachnick, B.G., & Fidell, L.S. (2001). *Using multivariate statistics*. Boston, MA: Allyn and Bacon.

Tripoli, A.M. (1998). Planning and allocating: Strategies for managing priorities in complex jobs. *European Journal of Work and Organizational Psychology*, *7*, 455–476.

Vancouver, J.B., & Day, D.V. (2005). Industrial and organization research on self-regulation: From constructs to applications. *Applied Psychology: An International Review*, *54*, 155–185.

Van Eerde, W. (2003). A meta-analytically derived nomological network of procrastination. *Personality and Individual Differences*, *35*, 1401–1418.

Van Eerde, W., & Thierry, H. (1996). Vroom's expectancy models and work-related criteria: A meta-analysis. *Journal of Applied Psychology*, *81*, 575–586.

Van Veldhoven, M., de Jonge, J., Broersen, J.P.J., Kompier, M., & Meijman, T. (2002). Specific relationships between psychosocial job conditions and job-related stress: A three level approach. *Work and Stress*, *16*, 207–228.

Van Veldhoven, M., Meijman, T.F., Broersen, J.P.J., & Fortuin, R.J. (1997). *VBBA manual: An investigation of perceptions of psychosocial workload and work stress by means of the survey perception and assessment of the work situation* [Handleiding VBBA: Onderzoek naar de beleving van psychosociale arbeidsbelasting en werkstress met behulp van de vragenlijst beleving en beoordeling van arbeid]. Amsterdam: SKB.