Francis-Smythe J.A. (2006) Time Management. in Timing the Future: The Case for a Time-Based Prospective Memory. Eds. J. Glicksohn & M. Myslobodsky. World Scientific Publishing.

Chapter XX

Time Management

Jan Francis-Smythe

Introduction

This chapter explores the relationship between time-based prospective memory and the popular notion of time management. **Time management** is proposed to be the behavioural manifestation of a **Time Personality**[1], which in itself is the result of the interaction between inherent predisposition and environmental influence.

Time-based prospective memory is the recall of an action to be performed at an appropriate time[2], perhaps more easily conceptualised as the ability to remember to perform intended actions in the future, for example, go for your dentist appointment at 2 pm next Thursday. In time-based prospective remembering, the action to be recalled is likely to be unrelated to the activity currently being performed and is therefore a self-initiated process. Much past research has shown age differences in prospective memory where older peoples' recall is impaired relative to younger peoples[3]. However, it has been found that in real-world tasks, where people are free to use their own system for remembering, often termed compensatory strategies, there are generally few age-related impairments[4]. Time management may be one such *compensatory* strategy. This chapter proposes that time management is also used

as an *aiding* strategy to prospective memory in situations where there is no failing or impairment of prospective memory but simply a desire to optimise prospective memory ability or to divert cognitive resources elsewhere. This chapter therefore proposes that the use of time management is both a *compensatory* and an *aiding* strategy for prospective memory. Through a review of the psychological literature it explores the nature of time management, the factors which may affect its use as a compensatory or aiding strategy for prospective memory and the potential outcomes of its use.

The Nature of Time Management

Time management is a term that is used routinely in everyday language. We hear comments like "She's late again – if only she could manage her time better!" or "Yes, I have a slot between 2.30 and 3.00 when I could fit you in", but what is time management and how has the academic literature defined it? According to Peeters and Rutte[5] "up till now a commonly accepted scientific definition of time management is lacking" (p.65).

One of the earliest references to time management was in 1973, when according to Lakein[6], it meant determining needs, setting goals to achieve the needs, prioritising the tasks required and matching tasks to time and resources through planning, scheduling and making lists. In 1991, Britton and Tesser[7] added 'carrying out the tasks' to the list of activities but it was not until 1999 that Francis-Smythe and Robertson[8] drew attention to the fact that whilst all of these activities address an essential first stage in time management, namely effective planning and action, there is also an additional and perhaps even more crucial stage, that of keeping to the schedule, which is as much about monitoring as 'doing'. Whilst the most recent definition[5] includes monitoring progress, it omits scheduling (the planning of 'when' the task(s) will be completed) and more importantly the monitoring of the schedule. In effect then, it might be suggested that their definition is more about project management than time management. Perhaps a better definition might be: Time management means setting and prioritising goals, planning and scheduling tasks, and monitoring progress both against the schedule and of task completion.

Monitoring is a key point for this chapter, which is exploring the relationship between time management and prospective memory (remembering to do something at a particular time). Introducing this element allows for the fact that plans may need to change, maybe as a result of changing priorities or unexpected resource limitations, reflecting the thoughts of Kleiner[9] that successful time management is about "juggling the many tasks at hand at any one time" (p.24). The definition thus needs to reflect this iterative process: Time management means setting and prioritising goals, planning and scheduling tasks, and monitoring progress both against the schedule and of task completion in an iterative process, in order to accommodate changing goals and priorities. The dominant view has been that people engage in time management in order to be more efficient and to enable them to better achieve their objectives. The notion that this 'efficiency' is subjective and that time management may be difficult is alluded to by Koch and Kleinmann[10] "time management is the self-controlled attempt to use time in a subjectively efficient way to achieve outcomes" (p.201). Incorporating this into the definition we have: Time management is the self-controlled attempt to use time in a subjectively efficient way to achieve outcomes through setting and prioritising goals, planning and scheduling tasks, and monitoring progress both against the schedule and of task completion, in an iterative process, in order to accommodate changing goals and priorities. The terms 'self-controlled attempt' and 'subjectively' are important as they reflect the very individualistic nature of time management; we don't always succeed with our attempts and one-way doesn't suit all.

Measuring Time Management

Time management has traditionally been measured through self-report. The following three instruments are those most frequently cited in the literature (i) The Time Structure Questionnaire (TSQ[11]) contains 26 items that measure the degree to which people perceive their use of time as structured and purposive, measured through five scales: Sense of Purpose(SP)—related to having a sense of purpose in life, Structured Routine(SR)—related to routine and planning, Present Orientation(PO)—related to having a tendency not to think

about missed opportunities or about the future, Effective Organisation(EO)–related to organisation, motivation and activity patterns and Persistence(P)—related to persistence and the maintenance of activities. Alphas have been reported as follows[12]: SP=0.75; SR=0.76; PO=0.55; EO=0.75; P=0.75. (ii) The Time Management Questionnaire (TMQ[7]) with 3 sub-scales of Short-Range Planning (extent of daily and weekly planning), Time Attitudes (extent to which time is perceived as used constructively and perception of control over time) and Long-Range Planning (perceived ability to plan ahead for several weeks and avoid procrastination). (iii) The Time Management Behaviour Scale (TMBS[13]) containing 4 sub-scales of Setting Goals and Priorities (setting of goals and prioritising of tasks to achieve them, coefficient alpha =0.83), Mechanics-Planning and Scheduling (behaviours associated with managing time such as making lists and planning, coefficient alpha =0.62), Perceived Control of Time (extent to which person believes they can affect how time is spent, coefficient alpha =0.69) and Preference for Dis-Organisation (preference for disorganisation in one's workspace and approach to projects, coefficient alpha =0.60). The TMBS has been shown to correlate significantly with the TSQ[12] ($r=0.69, p<0.001$). An appraisal of each of these shows that they focus predominantly on the planning, prioritising and scheduling activities of time management and less on the monitoring or flexibility aspects of the newly proposed definition. A revised measure of time management is therefore now called for to accommodate this.

Time Management and Prospective Memory

The purpose of time management then is to achieve outcomes. These outcomes may be many and varied, for example, from completing several major projects with competing deadlines on time, to remembering to post a birthday card so it arrives either on or before the due date or to be on time for your dentist appointment. Whilst achieving the first (completing the projects) may require some use of prospective memory, it is likely to require the additional planning, prioritising, scheduling and monitoring behaviours of time management as well. Achieving the second (posting the birthday card) may rely totally on prospective memory by simply going to

buy the card and posting it two days before the actual birthday, or it may be *aided* by employing simple or complex time management behaviours. For example, [simple] making a note in a diary two days before the birthday to buy and post the card, [complex] buying all your birthday cards for the next three months in one visit to the shop, writing them in advance, labelling them with to-be-posted dates, filing them in a calendared to-do file, checking the file each day and actioning its contents for that day—in this case posting the card. (Dare I admit that as a time management obsessive, this is my own preferred method but with a slight modification—instead of a calendared to-do file they sit prominently date-sequenced on the kitchen window-sill!). Achieving the third (dentist appointment) may again rely totally on prospective memory (we all know someone who says they never need to write appointments down they just remember them!). However, one may use a diary as a back-up to prospective memory or in place of prospective memory (aiding strategy—the busy Chief Executive only knows he or she has a dentist appointment because their time planner says so!). Time management then is much more than 'remembering to do something on time', however for the purpose of this chapter, whilst each of the important different aspects of the literature related to time management will be considered, they will be discussed with the specific focus of how they contribute to our understanding of the relationship between time management and prospective memory and the extent to which they might support the case for a time-based prospective memory.

Time Management and *External Aids*

The most obvious aspect of time management that is related to prospective memory is the use of external aids (e.g., alarm, diary, calendared to-do file, time planner) as a reminder to do something at a certain time. The effectiveness of external memory aids for improving prospective memory has been reported in a number of studies e.g.[14]. Burt and Forsyth[15]suggest people use these external aids to avoid the stress and anxiety associated with the failures of managing their day-to-day activities; typically they show how different formats of planners can have implications for the effectiveness with which they can do this.

Whilst past research on the use of such aids has shown that with increasing age there is a growing tendency to use them[16], with the advent of the new technologies such as mobile phones and 'BlackBerries' (the new mini-hand held computer that makes calls, accesses emails and the internet and is used so extensively by younger people) this may well no longer be the case. By way of example, my daughter, a 27 year-old accountant recalls how despite the fact that she is a 'good' time manager and has 'never missed' an appointment she always sets her mobile phone alarm on 'vibrate' whilst she is in the office to signal important impending appointments. For the even more technically minded personal digital assistants and Blackberries can serve the same purpose. The impact of the availability and use of these technologies on our inherent ability to estimate time will be an interesting avenue for future research. We might ask if the use of these external aids is only associated with preventing failures of prospective memory, that is as a **compensatory strategy**? The answer is no. As well as aiding recall, they provide a means of using time more efficiently, of allowing others to plan one's time and of controlling potential **prospective memory overload**. In other words, use of an external aid (as a means of time management) is also an **aiding strategy** to prospective memory.

Time Management – Inherited and/or Learnt?

Time management as discussed here has been considered as a process, a set of behaviours or, in contemporary terms, as a 'competency' where 'competencies' are the behaviours that a person carries out to achieve results. Whilst there have been competing explanations over the years as to what determines behaviour (trait theorists e.g.[17,18]; situational theorists e.g.[19]), it is now generally accepted that behaviour is determined jointly by individual characteristics and the situation (interactionism e.g.[20,21]).

From this interactionist perspective, whilst 'competency potential' are those individual attributes necessary for someone to produce the desired behaviours[22], the manifestation of those behaviours may depend on the situation. The extent to which time management is used and the types of behaviours/styles adopted will be heavily influenced by our individual time-related characteristics

but ultimately the situation will determine the behaviour, that is if the boss says that he or she wants something now and it does not fit with your schedule—you'll still do it! The suggestion, therefore, is that we have developed a range of time-management behaviours (here considered as a compensatory or aiding strategy to prospective memory) that are founded on our own individual time-related characteristics, which we may or may not use in different situations.

The extent to which time management behaviour is malleable has been questioned by a number of researchers e.g.[12,23-26]. This has major implications for the time management training industry. Research that has evaluated the efficacy of time management training might be expected to go some way towards addressing this. The effects of increased use of time management on reduction of stress and increased performance is well documented (see later section), however, according to Claessens, Van Eerde, Rutte and Roe[27] there is limited empirical evidence to show that time management training increases time management behaviours(for example[28-33]). So, what might these individual time-related characteristics that precede and contribute to time management behaviour be and what situations might facilitate or inhibit their display?

Factors Which May Affect the Use of Time Management as a Compensatory or Aiding Strategy for Prospective Memory

Ability to Estimate Time Accurately

If prospective memory is the ability to remember to perform intended actions in the future, when someone does not turn up for an appointment at 2 pm today, do we assume this is a prospective memory failure? Not necessarily. It could be that they simply did not recall the intended action (prospective memory failure), or it could be that they recalled it but decided not to go (no longer an intended action), or it could be that they recalled it at some point before the scheduled time, intended to go but were then unsuccessful in

managing their time between the point of recall and the time of required action (time management error) and in fact turned up late. When someone 'misses' an appointment, how often do we attribute the cause to each of the above, and on what basis do we make those attributions? If it's my mother, who is 85, then I might assume it is an age-related prospective memory failure, if it's my colleague who is highly achievement-orientated and maximises the use of every minute, then I will assume she is late because she has mis-managed her time and 'over-run', if it's my boss then I might assume she no longer thought it important enough. What might seem at the outset a prospective memory failure may or may not be one. In the case of my mother, time management might be useful as a compensatory strategy for prospective memory in which she checked her calendar each day for appointments or set an alarm clock to remind her when to do things. In the case of my colleague, time management may have replaced prospective memory, she has become reliant on diaries and to-do lists and yet that still fails. Why is this? Could it be because even with an effective prospective memory or time management as an aiding strategy we still need to be able to estimate time?

By way of example, I remember this morning that I have to go to the dentist at 2 pm—how will I actually achieve this? By setting an alarm to go off at 1.50 pm to tell me to leave the office, or simply roughly monitoring the time passing this morning and then more accurately monitoring the time passing after say 1 pm? Doing it at the right time (unless an external aid like an alarm is used) requires us to be able to monitor the passing of time and, just as importantly, be able to estimate the duration of our preceding planned activities so that we do not over-run. Are some people better at estimating time durations than others and what relationship is there, if any, with time management or prospective memory?

Francis-Smythe and Robertson[8] proposed that 'good' time management requires the ability both to plan a schedule and keep to it and that this will involve an ability to predict in advance how long a task will take (expected duration estimate), to estimate time in passing (prospective duration estimate) and to estimate retrospectively how long the task (or subcomponents of the task) have taken (retrospective duration estimate) (for a review of these three time estimation paradigms see Block[34]). Remembering to do

something on time such as turning up for an appointment will also require the same degree of estimating and monitoring of time.

The Planning Fallacy

Faced with the task of scheduling one or a list of tasks for completion it is obviously necessary to be able to predict in advance how long each task will take to complete (expected duration estimate) irrespective of whether they are to be scheduled consecutively or simultaneously. There is a whole body of literature based around the 'planning fallacy'—a tendency of people to believe that they will complete a future task significantly sooner than they actually do[35,36]. There is considerable evidence that people under-estimate the time it will take to complete a task in a wide-range of activities from novel laboratory tasks to large-scale industrial projects(for review see[37]) and indeed that this optimistic prediction does not lessen as the deadline approaches[38]. We might therefore expect that most people will under-estimate the duration of their preceding activities, over-run and be late for the appointment.

But is this the case? Kruger and Evans[37] suggest that there are a variety of complementary explanations for the planning fallacy including (a) inside/outside accounts, (b) motivation accounts and (c) unpacking, each of which is an important contributor to the effect. The inside/outside account (original explanation by Kahneman & Tversky [39]) suggests that when people consider how long it will take them to complete a task, they adopt an 'inside' or 'singular' perspective, focusing on the specific aspects of the task and a scenario of how it will be completed as opposed to an 'outside' or 'distributional' perspective based on how long similar tasks have taken in the past. A number of findings have supported this explanation e.g.[35,40-42].

The second explanation, failure to unpack, suggests that peoples' errors arise because they do not consider each of the sub-components of a task. Koole and Spijker[43]describe this as a practical application of Gollwitzer's[44]concept of implementation intentions, that proposes that, to ensure an intention is carried out one needs to form a plan (implementation intention) that sets out the where, when and how of the behaviour so that the deadline is met. Gollwitzer[44]

describes the function of implementation intentions as "passing the control of one's behaviour on to the environment" (p.173). The formation of implementation intentions results in a strategic switch from conscious and effortful goal-directed behaviour to being automatically controlled by selected situational cues and has been shown to increase a variety of behaviours, including the likelihood of breast self-examination[45]; taking vitamin pills[46]; using public transport[47]. Interestingly then, this is in effect moving the prospective memory requirement from time-based to event-based. Koole and Spijker[43] showed that students who formed such intentions could reduce the planning fallacy. They asked students to write a story about a particular day in the following two weeks. Half the participants were asked to form implementation intentions concerning where and when they would write the story and then to predict when it would be completed. The rest of the participants were simply asked to predict when they would finish the story without formulating implementation intentions. The group that furnished their goals with implementation intentions made more optimistic predictions but, importantly, was more likely to complete within their estimated time than the group without such intentions, thus reducing the planning fallacy. Williams[48] has shown that implementation intentions work best for those low in strategic control (a measure of the amount of control people perceive themselves to have in their environment; a combination of measures of time management behaviour, procrastination, order and self-discipline).

Motivational explanations have also been suggested[8,49,50]. Byram[50] showed that participants' predictions were more influenced by their motivations than by their cognitions. In a study in which participants were encouraged to evaluate multiple scenarios (optimistic, best guess and pessimistic) and to decompose tasks into sub-tasks, the planning fallacy was still evident and was in fact more affected by a manipulation of incentives. Under-estimation of the time it would take to complete tasks and sub-tasks became even greater when financial incentives were introduced. These findings are supported by others[51,52] who suggest rather than examining cognitive processes alone examination of explicit **motivation**s (internal and external) may be an important consideration in judgment and prediction research.

Burt and Kemp[49] and Francis-Smythe and Robertson[8] similarly suggest that the accuracy of peoples' estimations of the time it will take them to complete a task will be driven by the estimation strategy they use. Burt and Kemp[49] asked students to estimate the duration of 10 activities (e.g., going for a specified walk, completing a form, sorting a pack of cards) and then to complete five of the activities of their own choosing under timed conditions. They suggest that in their study, where participants were free once one task was completed to move on to the next task, participants used a safe-estimation strategy, whereby unused time was used to begin the next activity sooner. Francis-Smythe and Robertson[8] asked participants to estimate how long it would take them to spell-check three pages of text, and then subsequently carry out the task, prior to moving on to the next task. All participants were aware they would progress together from the spell-check task to the next task irrespective of when they finished the spell-check. In other words, free un-used time was not available at the end of the spell-check task for use in beginning the next task. It was suggested that in this context, where there was no motivation for over-estimating the expected duration of the task because they could not begin the next task any sooner, participants employed a strategy aiming to maximise accuracy**.** Therefore, if predicting duration of a major project, where winning the contract may be determined by ability to complete soonest, an optimistic estimation strategy may be used (i.e., the planning fallacy), if predicting the duration of a series of tasks with no external constraints or when being on time for an appointment is involved, then a safe-estimation strategy may be used. Francis-Smythe and Robertson[8] also suggest that the choice of strategy is likely to be affected by individual differences, typically those high on anxiety may use safe-estimation strategies, over-estimating the time a task will take with the result that they have un-allocated time gaps and are always early for tasks/appointments, whereas a person high on time urgency who needs to achieve more and more in less time will be more likely to use an accurate-estimation strategy to ensure that lost 'waiting' time is minimised—even to the extent that they will risk arriving late for appointments rather than be early and waste time.

It is likely then that those who succumb to the planning fallacy are perhaps in most danger of not doing something on time,

as their previous task is likely to over-run. Traditionally, attempts to reduce the planning fallacy have focused on encouraging more pessimistic or realistic predictions. But the optimistic outlook can have positive effects on motivation and goal-achievement[53,54] so more recently attention has turned to looking at ways to reduce the planning fallacy by encouraging behaviours to ensure the project is completed on time e.g.[37,55,56].

Time Management and the Planning Fallacy

Is there any evidence to suggest that 'good' time managers are any better at estimating expected durations, that is that they are accurate at estimating how long a task will take to complete and hence are less prone to the planning fallacy? Burt and Kemp[49] carried out a study in which students completed the Time Structure Questionnaire (TSQ[11]) and were asked to estimate the expected duration of 5 activities (e.g., going to the library and checking out a book, writing a one-page letter, etc.) on a 60 minute time-line. They were then asked to complete the activities under timed conditions without a watch and then to verbally estimate how long they thought the activities had actually taken (retrospective). They showed that participants who felt they were capable of managing their time were, in fact, quite poor at estimating how long it would take to perform the activities. However, Francis-Smythe and Robertson[8] in a similar study utilizing tasks of spell-checking a page of text, watching a video and completing a cross-word puzzle, (but where the more specific time-management scale (the TMBS[13]—Time Management Behaviour Scale) was used) showed that people who perceived themselves as 'good' time managers were in fact more accurate at estimating the duration of a future task. Of those who did not perceive themselves as 'good' time managers, some grossly over-estimated but many under-estimated the duration of an up-coming task to quite a considerable extent. This latter finding of under-estimation by many of the self-reported 'poor' time managers is supportive of the planning fallacy. These findings suggest that 'good' time managers are better at estimating how long tasks will take and hence should therefore not 'over-run' to the same extent as 'poor' time managers on tasks preceding a scheduled intended

action, in other words it might be expected that they will be more likely to remember and carry out a future action on time.

Monitoring Time

Keeping to a schedule once set is likely to involve monitoring time as it passes—if I have scheduled a meeting to run between 2 and 4 pm with another one to begin at 4 pm, then being on time for the second meeting requires me, with or without the use of an external aid such as a clock, to monitor time in passing. This might be by estimating time as it passes (prospective estimates) or by reflecting at certain key points how much time has just passed (retrospective estimates) and keeping a running total. In a study where participants were required to perform a series of actions at precise moments while watching a film[57] and in another study where participants were given a word-learning task and asked to push a button at a pre-defined moment[58] it was shown that the time checks gradually increased as the critical moment approached and that this behaviour enhanced prospective memory (recall) performance. Costermans & Desmette[59] carried out a study which required participants to carry out actions indicated by cards at specific times whilst viewing a film. This work showed that whilst overall participants checked the time more frequently as the specific times approached there were individual differences in this behaviour. Those showing stronger rate increases (number of times checked per minute) performed better on the prospective memory task, that is those with weaker strategies produced delayed responses. This suggests, for time-based prospective memory, that time monitoring is vital and that time monitoring acts as an intermittent cue in ongoing behaviour to help keep in mind future required actions, and that there are variations in peoples ability/motivation to do this. In each of these studies, a clock was available for the participants to check the time. In the Francis-Smythe and Robertson[8] study, referred to earlier, participants were asked to estimate time prospectively and retrospectively without sight of a clock. This work showed that those who perceive themselves as ‘good’ time managers tend to experience time as

flowing more rapidly—thus over-estimating the duration of the time that had passed. For example, 10 actual minutes passing might seem like 20 minutes and be estimated as such. This is suggested as a motivational strategy designed to enhance a sense of control over time as it ensures they will always be on time for the next task, or alternatively it may have been a cautious reaction to the lack of an external time check such as a watch which they suggest 'good' time managers may be more dependent on. In summary then, these findings suggest that those who perceive themselves as good at, and utilizing, time management behaviours do seem to be more accurate at estimating future task durations (less prone to the planning fallacy) and at keeping to a schedule by over-estimating time in passing. This then might suggest that 'good' time managers are more likely to complete a task on time and as such be effective in their use of time management as an aid to prospective memory.

Interest and emotion. Other factors are known to affect perceived duration, for example, **interest** in task (for high interest tasks, time appears to pass more quickly[8,60], and **emotion** or affect (positive emotional slides appear to pass more quickly than negative emotional ones[61]). The role of time management as a possible moderator of these effects appears not to have been explored. It is an interesting question whether time management behaviour might reduce or suppress interest and emotion effects. Are those who are 'good' time managers less prone to interest and emotion effects?

Time-Related Personality Characteristics

A review of the literature shows that an interest in time and individual differences spans a period from the early 1900s to the present day across a range of disciplines including psychology, management and organisation studies, marketing, consumer behaviour and sociology. However, research in each of these areas has proceeded along quite disparate paths with the result that in the literature there exists a number of individual attributes related to time. These may be attempts to measure attitudes towards time, thoughts or feelings about time or time-related behaviours. Some of the more prominent constructs include time orientation, punctuality, time urgency, polychronicity and procrastination (for a review see Francis-Smythe & Robertson[1]). More recently, Francis-Smythe &

Robertson[1] sought to integrate much of the previous work into the identification of a *time personality*, a multi-dimensional construct which takes account of individual behaviours, cognition and affect and which is measured through the Time Personality Indicator (TPI[62]). This five-factor indicator comprises Leisure Time Awareness (an awareness of actual clock time and how time is being spent, Cronbach alpha =0.71, example item 'I generally prefer not to be aware of what time it is on holiday'), Punctuality (attitude towards being on time—at the level of both minutes and days, Cronbach alpha =0.71, example item 'I prefer not to be late for social appointments'), Planning (attitude towards planning and sequencing tasks in advance, Cronbach alpha =0.70, example item 'at work, I like writing lists to help me sequence my activities), Polychronicity (preference for doing more than one thing at a time, Cronbach alpha =0.63, 'At work I don't mind having to have several things on the go at the same time') and Impatience (tendency to want to complete task in hand quickly, Cronbach alpha =0.65, 'At work, I frequently feel like hurrying other people up'). Of the myriad of time-related constructs that exist, those of time urgency, procrastination and polychronicity appear to have been the most extensively researched to-date. These traits will now be considered in more detail and from the perspective of being predictors or precursors of time management behaviours, the final behaviours being the result of the interaction of any number or combination of these (and other) traits and the situation. More specifically, for this chapter, the interest will be on the way in which these characteristics may affect the use of time management behaviours as a compensatory or aiding strategy for prospective memory—remembering to do something on time.

Time Urgency

Time urgency is considered to be a multi-dimensional construct, one of the components of Type A behaviour pattern, composed of time awareness, scheduling, list making, eating behaviour and deadline control[63]. Koslowsky[64] describes how people high on time urgency feel the pressure of time on all occasions and during all activities, whether work, recreation or leisure. Time

urgency has been shown to be an important predictor of both negative health and positive performance outcomes, typically coronary heart disease, hypertension, sleep, respiratory and digestive problems, higher classroom performance, better work-related attitudes and punctuality at work[65-69]. Conte, Schwenneker, Dew and Romano [66], in a study with undergraduate students, showed that those who perceived themselves as high in time urgency estimated time as passing faster than it actually does. Dishon-Berkovitz and Koslowsky[67] showed that employees high on time urgency had significantly less recorded incidents of lateness for work. From this it might be suggested that high time urgency might predispose people to use effective time management behaviours as either compensatory or aiding strategies to prospective memory to 'remember to do things on time'.

Procrastination

Procrastination has been defined as a self-regulation style that involves delay in the start and/or completion of a task[70] and has been shown to result in negative mental and physical health consequences such as anxiety and depression and fewer wellness behaviours such as healthy eating and exercise[71,72]. Both trait and situational explanations of procrastination appear in the literature, such as low self-esteem, low self-efficacy, perfectionism, fear of failure, boredom proneness, low conscientiousness and task aversiveness (for review see Vodanovich & Rupp[72]). Typically those low in self-esteem or perceived self-competence in carrying out a task are more likely to procrastinate. Sirois[71] has shown in a study of health-related activities that the lowered self-efficacy of procrastinators led to lower intentions which in turn led to less healthy behaviours. However, previous work with college students and academic tasks shows only differences in actual behaviours of procrastinators and non-procrastinators, not in their intentions.

Time discounting. Behavioural decision-making explanations based on time discounting have also been proposed. Positive time discounting (a universal phenomenon that people value delayed outcomes less than immediate outcomes) is exhibited more by procrastinators than non-procrastinators[73]. Koch and Kleinmann[10] claim positive time discounting is witnessed daily with respect to

time management behaviours. Typically, we see people completing all their small, non-important tasks before starting on a new major project, that although more important has a more distant deadline. The reward for the major project is a long way off, the satisfaction of completing the small non-important tasks now is immediate. Refusing to allow yourself to read your emails on a day that you have allocated to writing that paper is another way to minimise the bias, that is putting ourselves into an environment where there are few alternatives when we need to work on a longer-term less urgent goal. In contrast, non-procrastinators are more likely to engage in negative time-discounting 'saving the best till last', getting rid of lots of little unrewarding tasks to then look forward to and enjoy the larger more rewarding one (a preference for improvement). Konig and Kleinmann[74] showed that negative time-discounting was facilitated the closer the tasks were to each other in time and suggest that this has an implication for interventions for procrastinators—if a series of tasks can be broken down into smaller ones which are close to each other in time (i.e., the use of implementation intentions as described previously), then there is more chance that negative time discounting will be used and the smaller less rewarding tasks completed first in a preference for improvement mode, thereby decreasing procrastination. Puffer[75] also relates the setting of task priorities to the emotional reaction to a task rather than the goal of efficiency ('the urgent but unimportant issue') and the satisfaction of completing lots of small tasks. Similarly, more recent work by Tice, Baumeister & Zhang[76] suggests that procrastination occurs as a result of affect regulation taking priority over other programs of self-regulation (the priority hypothesis). Tice et al.'s[76] work shows that when people think doing something immediately will make them 'feel' better, they opt for the small reward now rather than the larger reward later, in other words emotional distress undermines self-regulation, and procrastination is often caused by the immediate desire/need to make oneself 'feel better'.

Positive procrastination. Van Eerde[77] proposes that whilst much of the literature to-date presents procrastination as dysfunctional, there may be certain circumstances where this is not the case, typically in creative work where the time gained serves to incubate ideas, where the time pressure creates a challenge leading to

actually completing the task faster, as a temporary relief from stress or as a strategic effort to repair a bad mood.

Whilst there appear to be no studies in the literature that have explored procrastination and time-based prospective memory, this review suggests that the extent to which someone is a procrastinator may well affect their ability to carry out an activity on time; whilst the procrastinator may remember something needs doing, their intentions may be weaker and the task does not get completed on time for any one of the explanations given previously. For those high on procrastination, the use of time management as a compensatory or aiding strategy to prospective memory is recommended in the literature (e.g., use of implementation intentions) to increase the likelihood that something gets 'done on time'.

Polychronicity

Of each of the individual difference constructs mentioned so far, polychronicity is the one that has perhaps been most extensively studied with respect to time management. The term polychronic time use is said to have originated with Hall's[78] work in anthropology, but has been more recently defined as the extent to which people prefer to engage in two or more tasks or events simultaneously[79,80]. Bluedorn, Kaufman and Lane[79] discuss how this is not as simple as moving between say three different tasks, focusing on each one monochronically (one at a time), but that the polychronic is likely to dovetail the tasks so that in the move between tasks there is a period when both tasks are being worked on or thought about at the same time, the more switching there is, the more polchronicity. Slocombe and Bluedorn[81] draw a distinction between polychronicity and time urgency, saying that polychronicity is about the preferred pattern of activity (i.e., how work is done), whereas time urgency is about the rate of activity (i.e., how much work is done). Kaufman-Scarborough and Lindquist[82] allude to the fact that the traditional view of time management up to the late 80s was founded on assumptions of monochronicity—orderly behaviour where time is used for one purpose within a given clock block, that activities are sequenced, and that time is measured objectively in minutes and hours. In earlier studies, polychronicity was linked to time pressure

where people were forced to tolerate interruptions and combine tasks, it was not perceived as a desirable means of time use. More recent research, however, acknowledges the positive nature of polychronicity and its role in many work settings, especially where they involve relationship building or people facing roles. Indeed, Slocombe[83] suggests the decision to operate mono or polychronically may reflect a decision based on priority of relationships over task.

Managed polychronicity. Whether the situation demands it or it is an individual preference, polychronicity can be accommodated in a time management behaviour repertoire, such as blocking out time to be focused on one task, allowing time for interruptions, in other words, polychronics can still time manage—they just do it in a different way. This is perhaps best demonstrated in Kleiner's[9] definition of time management, "juggling the many tasks at hand at any one time". Indeed, in a study of householders Kaufman-Scarborough and Lindquist[82] showed that polychronics reported using time planners to the same extent as monochronics, and pocket planners more often. They also updated them more often, leading them to the conclusion that both mono and polychronics engage in time management but in different ways. Interestingly, and conversely, a study by Frei, Racicot & Travagline[84] showed that whilst academic faculty members' involvement in multiple projects gave the impression they were polychronic, they had a preference for monochronicity. They handled this by dividing their time into smaller and smaller chunks so that within these chunks they could operate on one project at a time monochronically. The situation demanded polychronicity and so they developed an approach which best accommodated both the situational need and their own preference to maximise organisational and individual outcomes and personal health.

Interestingly, polychronics tend to procrastinate less[82]. It has been suggested that because they can handle more than one task at a time, pursuing each in bite-size chunks towards their independent goals for completion, whereas monochronic persons will delay starting a task until they know they have a free run to finish it. This might also explain the 'urgent but unimportant' behaviour noted by Puffer[75] where, for example, we deal with our supposedly 'urgent' easy emails first, but put off getting on with (i.e., procrastinate over) the important report we really need to start writing.

In the same way as procrastination might enhance/facilitate creativity, so too might polychronicity. Creativity is having the ability to integrate diverse ideas and information[85]. This requires polychronic thought but Persing[86] shows us how this does not mean that creative workers necessarily prefer to work in polychronic environments. The key is volition and whether the individual is choosing to engage in the multiple tasks—in this case multiple thoughts. Van Eerde[77] proposed that procrastination in creative work gave extra time to incubate ideas. If extra time to incubate ideas is likely to enhance creativity then maybe being polychronic and making a start on a number of projects together rather than making good progress with just one will increase the incubation time, and hence creative output for each of them.

Polychronicity then may be seen as being both functional and sometimes dysfunctional dependent on a person's preference, the imposed situation and the compatibility between the two. Contrary to earlier views, polychronicity can form an effective mode of working within a time management framework. Again, whilst there have been no specific studies reported on polychronicity and prospective memory, it might be suggested that as polychronics are at ease with several tasks/thoughts on the go, at the same time they may well have little problem 'remembering to do something on time' either using prospective memory or time management as a compensatory or aiding strategy. Perhaps this is what is meant by the phrase 'If you want something done ask a busy person!'

There is a general acceptance in the individual-difference literature that the time-related personality constructs reviewed here do indeed represent traits—predispositions to respond in certain ways[66,77,87]. There is little empirical evidence to suggest whether these time-related predispositions can be attributed to nature (hereditary characteristics) and/or nurture (environmental influences) and what little there is appears to be focused around Type A behaviour in general and not specifically the time urgency element of it[24,88]. Anecdotally, whatever the origin, there must be few amongst us who have not witnessed the similarities in families in time-related characteristics. To what extent will these traits guide behaviour? From an interactionist perspective, ultimately the situation determines the behaviour but one might expect a high degree of stability in temporal behaviours across time when individuals are

presented with identical situations. Whilst there is some such evidence in the literature for stability of constructs (e.g., for time urgency[63]; time structure[11]; procrastination[89]; time personality[1]), it must be acknowledged that this is through test-retest reliability data typically collected over intervals of 1-2 months which is limited in terms of both time span and the fact that it can only be truly taken as indicative of the stability of the measures as opposed to the traits themselves. However, further tentative support comes from significant differences in time personality having been shown to exist between incumbents in different jobs, for example, teachers, managers and professionals score higher than students, careworkers and manual workers[1]. Whether this reflects the dispositional nature of the construct and that people have selected themselves into the 'best-fit' organisation[90], or whether in fact the construct is malleable and people have adapted to the requirements of the job, is not to be determined from cross-sectional data alone. Taken together, it is here suggested that varying combinations of differing time-related constructs or traits guide the time management behaviours that an individual uses in different situations. The importance of interactions between traits is as relevant here as with other aspects of personality. For example, whilst my partner is a chronic procrastinator, he is also high on punctuality. The combination of these traits means that he experiences extreme stress near a deadline, since he has put off beginning the task for as long as possible but is then compelled to deliver 'on time'. Contrast this with a chronic procrastinator who is low on punctuality, the task is put off but there is no compulsion to deliver on time, there is little resultant stress as the two traits are quite compatible. Much more research is needed to explore the role of individual time-related traits such as time urgency, polychronicity, procrastination and time personality in the manifestation of different time management behaviours under varying circumstances.

Situational Effects

So far, the effects of individual factors such as time estimation ability and time-related personality characteristics have been considered in relation to the use of time management as a compensatory or aiding strategy for prospective memory. But what

do we know about the extent to which the use of time management is determined by the situation? From an interactionist perspective we believe that whilst individuals will have differing preferences and abilities related to time, ultimately it is the situation which will determine behaviour. The extent to which the situation can support or tolerate these individual predispositions will determine which time management behaviours are manifest. 'Situations' which impose time-related constraints on individuals are varied, from personal and family relationships to leisure, holiday and work activities. Based on P-E (person-environment) fit theory[91] it has generally been proposed that 'congruity' or 'fit' between the individual and the situation is the ideal, leading to enhanced performance and well-being (for organisations see Francis-Smythe & Robertson[92] for review; Waller, Conte, Gibson & Carpenter[93] for teams; Adams & Jex,[94] for families). Typically, a job which imposes the need for punctuality, such as a train driver, might not be best suited to someone who scores low on Punctuality in the Time Personality Indicator[62] or a job on a production line might not best suit someone high in polychronicity. Interestingly, however, in a study of 277 parcel delivery drivers[92] it was shown that time personality per se as opposed to 'fit' was a better predictor of affective well-being. This was explained by suggesting that being punctual, organized, flexible and meeting deadlines serves to enhance the quality of workplace interactions and relationships with colleagues, clients and line-managers and hence affective well-being. The extent to which this might also apply in personal relationships would be an interesting avenue for future research.

Another 'situational' influence on time-related behaviour has been proposed by Slocombe[83] in the form of 'others beliefs' where it is suggested the Theory of Planned Behavior[95] can be used to explain polychronic behaviour. Typically, behaviour is determined by intention, which in turn is determined by belief (is polychronicity the best way for success?), attitude (is it good or bad for me to operate polychronically/how do I feel about it?) and subjective norm (what do others close to me think about me behaving polychronically?).

Situations may impose a need for us to behave in time-related ways which are not in line with our preferences and abilities, this may include 'remembering to do something on time' and in these instances we may adopt time management as either a

compensatory or aiding strategy to prospective memory to achieve positive outcomes. Importantly however, the extent and form of time management we adopt will likely be the one that best suits our individual preferences and abilities for that particular situation. For some this may mean adopting a more focused time monitoring strategy on the day of an appointment, for others it may mean setting an alarm clock to signal when the appointment is due. For my son, when challenged with cooking the Sunday roast, it means writing a schedule of when to put each of the different components into the oven to ensure it's delivered to perfection! Whilst we have a preference for particular behaviours/strategies, we are likely to have an individual repertoire of time management behaviours, which we apply in different situations.

The Potential Outcomes of the Use of Time Management as a Compensatory or aiding Strategy for Prospective Memory

A number of studies have demonstrated the positive effects of time management. These studies have mostly been conducted in the work and education context. Typically, researchers working with employees and students have found time management correlates positively with job satisfaction, self-reported job performance, grade point average, health and perceived control of time and negatively with job-induced and somatic tensions, strain and role ambiguity (for review see Claessens et al.[27]; Peeters & Rutte[5]). In 1994 Macan[29] proposed that the effects of time management on each of the outcome variables was mediated by perceived control of time, that is time management behaviour gave an enhanced sense of control over one's time which in turn produced the positive effects on performance and health. Claessens et al.[27], in a review of studies since 1994, claim that there is limited support for the notion that the effects of time management on performance and health are wholly mediated by perceived control of time and instead propose that time management behaviour has both direct and indirect effects on outcomes, arguing "engaging in time management behaviours may lead to a better temporal fit between personal resources and demands

allowing one to distribute energy and attention more effectively, thereby helping to avoid or reduce delays and overload" (p. 939). Francis-Smythe and Robertson[92] also showed that time personality had a direct effect on job-related affective well-being, proposing that being punctual, organised, meeting deadlines, and being flexible all serve to enhance the quality of workplace interactions and relationships with colleagues, clients and line-managers which in turn impacts on individual well-being.

Other work has focused attention on the fit between an individual's time management behaviours and/or personality (time urgency) and those of an organisation demonstrating positive outcomes on organisational commitment, performance, satisfaction and well-being[68,81,96,97]. In addition, some work appears to have been carried out in non-educational/occupational contexts, typically time-management strategies have been associated with reduced levels of stress and an increase in marital adjustment among married couples[94,98] and a reduction in work-family conflict[94].

The extent to which these findings wholly or partially apply to the narrower and more explicit concept of the use of time management as a compensatory or aiding strategy for prospective memory (i.e., remembering to do something on time) is not, as far as the author is aware, documented in the literature. However, if one assumes time management is being used as an effective compensatory strategy for prospective memory, then it would be assumed that it should alleviate or remove the negative effects of prospective memory failure and where it is being used as an aiding strategy it might be expected, as a result of 'doing things on time' to result in at least some of the positive outcomes described above, dependent on the context.

Summary

This chapter has suggested that time management can serve as a compensatory or aiding strategy for prospective memory and that time-estimation ability, time-related personality characteristics and situational effects may all play a role in determining the extent and nature of time management behaviours displayed. It has been shown

that it is generally accepted that effective prospective memory and/or time management enhances achievement of outcomes and promotes well-being by reducing negative outcomes. A number of researchers have discussed time management within the context of the stressor/strain literature and as such have proposed a number of competing models. Typically, Macan[29] suggests that the relationship between time management and strain is mediated by perceived control of time; use of time management gives an enhanced sense of control over time, which in turn reduces strain. Claessens et al.[27] support this view but claim that in addition, time management has a direct effect on strain, more time management less strain. In a similar vein, Koslowsky[64] proposes that time management itself acts as a mediator in the stress-strain process, and is a specific coping strategy allowing the individual to control several time-related components of the stressor. He also suggests that this relationship is moderated by time urgency, people high in time urgency who engage in time management behaviours are likely to experience less strain, but those low in time urgency may show little effect. Peeters and Rutte[5] however, suggest that time management is a moderator in the stress/strain process and that high time management results in less strain.

Whilst the studies cited above have explored a number of stressor and strain variables, findings from these and the discussion in the preceding sections on variables which may have an impact on the use of time management as a compensatory or aiding strategy to prospective memory (time estimation ability, time-related personality characteristics and situational effects) might lead us to suggest a possible exploratory framework/model for further research on the role of prospective memory and/or time management in a stressor/strain process, where the stressor is 'scheduled-activity ' and the strain or outcome variables are reduced **performance** and **well-being**. Whether prospective memory ability/time management are mediators (as in Figure 1. Model A—where they account directly for the effects of the scheduled-activity overload on strain—'mediators speak to how or why such effects occur'[99]) or moderators (as in Figure 2. Model B—where the effect of the overload is dependent on the effectiveness of prospective memory/time management) has yet to be established.

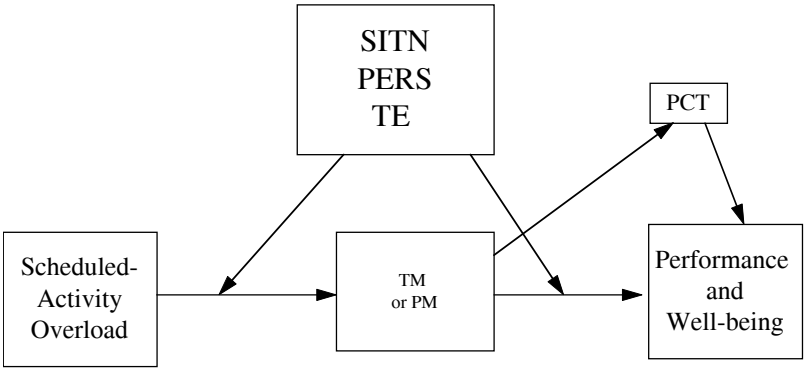

Figure 1. *Model A – Prospective memory/time management as mediators in stress/strain process.*

SITN = situational effects, PERS = time-related personality characteristics,
TE = time estimation ability, TM = time management, PM=prospective memory, PCT = perceived control of time

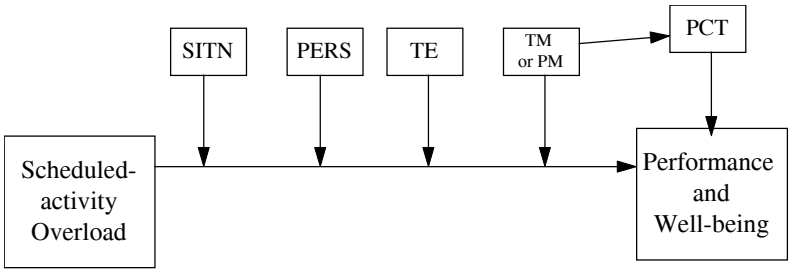

Figure 2. *Model B – Prospective memory/time management as moderators in stress/strain process.*

SITN = situational effects, PERS = time-related personality characteristics,
TE = time estimation ability, TM = time management, PM=prospective memory, PCT = perceived control of time

Through a review of recent work on time management, time estimation and **time-related individual characteristics** this chapter has supported the case for a time-based prospective memory by demonstrating how time management can be used as a compensatory or aiding strategy to prospective memory.

REFERENCES

1. Francis-Smythe J, Robertson I. Time-related individual differences. *Time and Society* 1999a;**8**(2)**:**273-307.
2. Wilkins AJ, Baddeley AD. Remembering to recall in everyday life: an approach to absentmindedness. In: Gruneberg MM, Morris PE, Sykes RN, eds. Practical aspects of memory. London: Academic Press, 1978: 27-34.
3. Cockburn J, Smith PT. Effects of age and intelligence on everyday memory tasks. In: Gruneberg MM, Morris PE, Sykes RN, eds. Practical aspects of memory: Current research and issues. Vol.2:Clinical and educational implications. Chichester: John Wiley & Sons, 1988: 132-136.
4. Schmidt IW, Berg IJ, Deelman BG. Prospective memory training in older adults. *Educational Gerontology* 2001;**27:**455-478.
5. Peeters MAG, Rutte CG. Time management behavior as a moderator for the job demand control interaction. *Journal of Occupational Health Psychology* 2005;**10**(1)**:**64-75.
6. Lakein A. How to get control of your time and your life. New York: Signet, 1973.
7. Britton BK, Tesser A. Effects of time-management practices on college grades. *Journal of Educational Psychology* 1991;**83**(3)**:**405-410.
8. Francis-Smythe JA, Robertson IT. On the relationship between time management and time estimation. *British Journal of Psychology* 1999b;**90:**333-347.
9. Kleiner BH. The art of handling many things at once. *Managerial Auditing Journal* 1992;**7**(6)**:**24-29.
10. Koch CJ, Kleinmann M. A stitch in time saves nine: Behavioural decision making explanations for time management problems. *European Journal of Work and Organizational Psychology* 2002;**11**(2)**:**199-217.

11. Bond MJ, Feather NT. Some correlates of structure and purpose in the use of time. *Journal of Personality and Social Psychology* 1988;**55**(2)**:**321-329.
12. Shahani C, Weiner R, Street MK. An investigation of the dispositional nature of the time management construct. *Anxiety, Stress & Coping* 1993;**6:**231-243.
13. Macan T, Shahani C, Dipboye RL, Phillips A. College students' time management: Correlations with academic performance and stress. *Journal of Educational Psychology* 1990;**82**(4)**:**760-768.
14. Long TE, Cameron KA, Harju BL, Lutz J, Means LW. Women and middle-aged individuals report using more prospective memory aids. *Psychological Reports* 1999;**85**(3/2)**:**1139-1153.
15. Burt CDB, Forsyth DK. Designing materials for efficient time management: Segmentation and planning space. *International Journal of Cognitive Technology* 1999;**4**(1)**:**11-18.
16. Maylor EA. Older people's memory for the past and the future. *Psychologist* 1996;**9**(10)**:**456-459.
17. Allport G. Personality: A psychological interpretation. New York: Holt, 1937.
18. Staw B, Ross J. Stability in the midst of change: A dispositional approach to job attitudes. *Journal of Applied Psychology* 1985;**70:**469-480.
19. Mischel W. Personality and Assessment. New York: Wiley, 1968.
20. Lewin K. Field Theory in Social Science. New York: Harper, 1951.
21. Schneider B. Interactional psychology and organisational behavior. In: Staw BM, Cummings LL, eds. Research in Organisational Behavior. Greenwich CT: JAI Press, 1983.
22. Robertson I, T, Callinan M, Bartram D. Organizational Effectiveness. Chichester: Wiley, 2002.
23. Calabresi R, Cohen J. Personality and time attitudes. *Journal of Abnormal Psychology* 1968;**73:**431-439.

24. Landy FJ, Rastgary H, Thayer J, Colvin C. Time urgency: The construct and its measurement. *Journal of Applied Psychology* 1991;**76**(5)**:**644-657.
25. Macan TM. Time management: Correlational examination with employees' stress, satisfaction, and performance. Unpublished manuscript, 1992.
26. Wessman AE. Personality and the subjective experience of time. *Journal of Personality Assessment* 1973;**37:**103-114.
27. Claessens BJ, Van Eerde W, Rutte CG, Roe RA. Planning behavior and perceived control of time at work. *Journal of Organizational Behavior* 2004;**25:**937-950.
28. King AC, Winett RA, Lovett SB. Enhancing coping behaviors in at-risk populations: The effects of time-management instruction and social support in women from dual-earner families. *Behavior Therapy* 1986;**17:**57-66.
29. Macan T. Time management: Test of a process model. *Journal of Applied Psychology* 1994;**79**(3)**:**381-391.
30. Macan TH. Time-management training: Effects on time behaviors, attitudes and job performance. *Journal of Psychology* 1996;**130:**229-236.
31. Orpen C. The effect of time management training on employee attitudes and behavior: A field experiment. *The Journal of Psychology* 1994;**128**(4)**:**393-396.
32. Slaven G, Totterdell P. Time management training: Does it transfer to the workplace? *Journal of Managerial Psychology* 1993;**8:**20-28.
33. Woolfolk AE, Woolfolk RL. Time management: An experimental investigation. *The Journal of School Psychology* 1986;**24:**267-275.
34. Block RA. Experiencing and remembering time: Affordances, context and cognition. In: Levin I, Zakay D, eds. Time and human cognition: A life span perspective. Amsterdam, North Holland, 1989: 333-363.
35. Buehler R, Griffin D, Ross L. Exploring the planning fallacy - why people underestimate their task completion times.

Journal of Personality and Social Psychology 1994;**67**(3)**:**336-381.
36. Tversky A, Kahneman D. Judgment under uncertainty: Heuristics and biases. *Science* 1974;**185:**1123-1131.
37. Kruger J, Evans M. If you don't want to be late, enumerate: Unpacking reduces the planning fallacy. *Journal of Experimental Social Psychology* 2004;**40:**586-598.
38. Williams SE, Francis-Smythe J. Strategic control, thought focus, and the planning fallacy: addressing individual differences in the time estimation and behaviour. *Manuscript in preparation.* 2005.
39. Kahneman D, Tversky A. On the psychology of prediction. *Psychological Review* 1973;**80**(4)**:**237-251.
40. Buehler R, Griffin D, Ross M. Inside the planning fallacy: On the causes and consequences of optimistic time predictions. In: Gilovich T, Griffin D, Kahneman D, eds. Heuristics and biases: The psychology of intuitive judgment. Cambridge, MA: Cambridge University Press, 2002: 250-270.
41. Dunning D, Griffin DW, Milojkovic JD, Ross L. The overconfidence effect in social prediction. *Journal of Personality and Social Psychology* 1990;**58:**568-581.
42. Vallone RP, Griffin DW, Lin S, Ross L. The overconfident prediction of future actions and outcomes by self and others. *Journal of Personality and Social Psychology* 1990;**58**(582-592).
43. Koole S, Spijker M. Overcoming the planning fallacy through willpower: Effects of implementation intentions on actual and predicted task-completion times. *European Journal of Social Psychology* 2000;**30:**873-888.
44. Gollwitzer PM. Goal achievement: the role of intentions. In: Stroebe W, Hewstone M, eds. European Review of Social Psychology. Chichester, England: Wiley, 1993: 141-185.
45. Orbell S, Hodgkins S, Sheeran P. Implementation intentions and the theory of planned behaviour. *Personality and Social Psychology Bulletin* 1997;**23:**945-954.

46. Sheeran P, Orbell S. Implementation intentions and repeated behaviour: Augmenting the predictive validity of the theory of planned behaviour. *European Journal of Social Psychology* 1999;**29:**349-369.
47. Bamberg S. The promotion of new behavior by forming an implementation intention: Results of a field experiment in the domain of travel mode choice. *Journal of Applied Social Psychology* 2000;**30**(9)**:**1903-1922.
48. Williams SE. Stand by Your Plan: A new approach to the planning fallacy. *Unpublished doctoral dissertation,University of Sussex, UK.* 2002.
49. Burt CDB, Kemp S. Construction of activity duration and time management potential. *Applied Cognitive Psychology* 1994;**8:**155-168.
50. Byram SJ. Cognitive and motivational factors influencing time prediction. *Journal of Experimental Psychology: Applied* 1997;**3**(3)**:**216-239.
51. Henry RA. The effects of choice and incentives on the over-estimation of future performance. *Organizational Behavior and Human Decision Processes* 1994;**57:**210 - 225.
52. Henry RA, Sniezek JA. Situational factors affecting judgments of future performance. *Organizational Behavior and Human Decision Processes* 1993;**54:**104 - 132.
53. Buehler R, Griffin D, MacDonald H. The role of motivated reasoning in optimistic time predictions. *Personality and Social Psychology Bulletin* 1997;**23:**238-247.
54. Sherman SJ. On the self-erasing nature of errors in prediction. *Journal of Personality and Social Psychology* 1980;**39**(2)**:**211-221.
55. Aarts H, Dikjerhuis AP, Midden C. To plan or not to plan? Goal achievement or interrupting the performance of mundane behaviors. *European Journal of Social Psychology* 1999;**29:**971-979.
56. Gollwitzer PM, Brandstatter V. Implementation intentions and effective goal pursuit. *Journal of Personality and Social Psychology* 1997;**73:**186-199.

57. Harris JE, Wilkins AJ. Remembering to do things: A theoretical framework and an illustrative experiment. *Human Learning* 1982;**1:**123-136.
58. Einstein GO, McDaniel MA, Richardson SL, Guynn MJ, Cunfer AR. Aging and prospective memory: examining the influences of self-initiated retrieval processes. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 1995;**21:**996-1007.
59. Costermans J, Desmette D. A method for describing time-monitoring strategies in a prospective memory setting. *Current Psychology of Coginition* 1999;**18**(3)**:**289-306.
60. Zakay D. Relative and absolute duration judgments under prospective and retrospective paradigms. *Perception & Psychophysics* 1993;**54:**656-664.
61. Angrilli A, Cherubini P, Pavese A, Manfredini S. The influence of affective factors on time perception. *Perception & Psychophysics* 1997;**59**(6)**:**972-982.
62. Francis-Smythe JA, Robertson IT. The Time Personality Indicator (TPI) Manual. Manchester,UK: Robertson-Cooper Ltd. Manual in preparation., 2005. http://www.robertsoncooper.com/company/homepage.aspx
63. Conte JM, Landy FJ, Mathieu JE. Time Urgency:Conceptual and construct development. *Journal of Applied Psychology* 1995;**80**(1)**:**178-185.
64. Koslowsky M. Some new organizational perspectives on moderators and mediators in the stress-strain process: Time urgency, management, and worker control. In: Erez M, Kleinbeck U, eds. Work motivation in the context of a globalizing economy. Mahwah,NJ: USum Associates, 2001: 313-327.
65. Conte JM, Mathieu JE, Landy FJ. The nomological and predictive validity of time urgency. *Journal of Organizational Behavior* 1998;**19:**1-13.
66. Conte JM, Schwenneker HH, Dew AF, Romano DM. Incremental validity of time urgency and other Type A subcomponents in predicting behavioral and health criteria.

Journal of Applied Social Psychology 2001;**31**(8)**:**1727-1748.
67. Dishon-Berkovits M, Koslowsky M. Determinants of employee punctuality. *The Journal of Social Psychology* 2002;**142**(6)**:**723-739.
68. Greenberg J. Time urgency and job performance: Field evidence of an interactionist perspective. *Journal of Applied Social Psychology* 2002;**32**(9)**:**1964-1973.
69. Wright L, McCurdy S, Rogoll G. The TUPA Scale: A self-report measure for the Type A subcomponent of Time Urgency and Perceptual Activation. *Psychological Assessment* 1992;**4**(3)**:**352-356.
70. Ferrari JR, Tice DM. Procrastination as a self-handicap for men and women: A task avoidance strategy in a laboratory setting. *Journal of Research in Personality* 2000;**34:**73-83.
71. Sirois FM. Procrastination and intentions to perform health behaviors: The role of self-efficacy and the consideration of future consequences. *Personality & Individual Differences* 2004;**37**(1)**:**115-128.
72. Vodanovich SJ, Rupp DE. Are procrastinators prone to boredom? *Social Behavior and Personality* 1999;**27**(1)**:**11-16.
73. Schouwenburg HC, Groenewoud JT. Study motivation under social temptation: Effects of trait procrastination. *Personality and Individual Differences* 2001;**30:**229 - 240.
74. Konig CJ, Kleinmann M. Business before pleasure: no strategy for procrastinators? *Personality and Individual Differences* 2004;**37:**1045-1057.
75. Puffer S. Task completion schedules: determinants and consequences for performance. *Human Relations* 1989;**42**(10)**:**937-955.
76. Tice DM, Baumeister RF, Zhang L. The role of emotion in self-regulation: Differing role of positive and negative emotions. In: Philippot P, Feldman RS, eds. The regulation of emotion. Mahwah,NJ: USum Associates, 2004: 213-226.

77. Van Eerde W. A meta-analytically derived nomological network of procrastination. *Personality & Individual Differences* 2003;**Vol 35**(6)**:**1410-1418.
78. Hall ET. The Silent Language. Garden City, NY: Doubleday, 1959.
79. Bluedorn AC, Kaufman C, Lane PM. How many things do you like to do at once? An introduction to monochronic and polychronic time. *Academy of Management Executive* 1992;**6**(4).
80. Kaufman CJ, Lane PM, Lindquist JD. Exploring more than 24 hours a day: a preliminary investigation of polychronic time use. *Journal of Consumer Research* 1991a;**18**(December)**:**392-401.
81. Slocombe TE, Bluedorn AC. Organizational behavior implications of the congruence between preferred polychronicity and experienced work-unit polychronicity. *Journal of Organizational Behavior* 1999;**20:**75-99.
82. Kaufman-Scarborough C, Lindquist JD. Time management and polychronicity: Comparisons, contrasts and insights for the workplace. *Journal of Managerial Psychology* 1999;**14**(3/4)**:**288-312.
83. Slocombe TE. Applying the theory of reasoned action to the analysis of an individual's polychronicity. *Journal of Managerial Psychology* 1999;**14**(3/4)**:**313-322.
84. Frei RL, Racicot B, Travagline A. The impact of monochronic and Type A behavior patterns on research productivity and stress. *Journal of Managerial Psychology* 1999;**14**(5)**:**374-387.
85. Sethia NK. The shaping of creativity in organisations. In: Hoy F, ed. Academy of Management Best Papers Proceedings 1989. Atlanta,GA: Academy of Management, 1989: 224-228.
86. Persing DL. Managing in polychronic times: Exploring individual creativity and performance in intellectually intensive venues. *Journal of Managerial Psychology* 1998;**14**(5)**:**358-373.

87. Ganster DC, Schaubroeck J, Sime WE, Mayes BT. The nomological validity of the Type A personality among employed adults. *Journal of Applied Psychology* 1991;**76:**143-168.
88. Wright L. The Type A behavior pattern and coronary artery disease. *American Psychologist* 1988;**43:**2-14.
89. Lay CH. At last, my research article on procrastination. *Journal of Research in Personality* 1986;**20:**474-495.
90. Holland JL. Making vocational choices. 2nd ed. Englewood Cliffs, NJ: Prentice Hall, 1985.
91. Edwards JR. Person-Job Fit: A Conceptual Integration, Literature Review, and Methodological Critique. In: Cooper CL, Robertson IT, eds. International Review of Industrial and Organisational Psychology. Chichester: Wiley, 1991: 283-357.
92. Francis-Smythe JA, Robertson IT. The importance of time congruity in the organisation. *Applied Psychology: An International Review* 2003;**52**(2)**:**298-321.
93. Waller MJ, Conte JM, Gibson CB, Carpenter MA. The effect of individual perceptions on deadlines on team performance. *Academy of Management Executive* 2001;**26**(4)**:**586-600.
94. Adams GA, Jex SM. Relationships between time management, control, work-family conflict and strain. *Journal of Occupational Health Psychology* 1999;**4**(1)**:**72-77.
95. Ajzen I, ed. From intentions to actions: A Theory of Planned Behavior. New York: Springer, 1985.
96. Kaufman C, Lane PM, Lindquist JD. Time congruity in the organization: A proposed quality of-life framework. *Journal of Business and Psychology* 1991b;**6**(1).
97. Schriber JB, Gutek BA. Some time dimensions of work: Measurement of an underlying aspect of organisation culture. *Journal of Applied Psychology* 1987;**72**(4)**:**642-650.
98. McLaughlin M, Cormier LS, Cormier WJ. Relationship between coping strategies and distress, stress, and marital

adjustment of multiple-role women. *Journal of Counseling Psychology* 1988;**35**(2)**:**187-193.

99. Baron RM, Kenny DA. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *Journal of Personality and Applied Psychology* 1986;**51:**1173-1182.