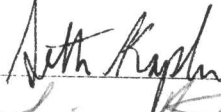

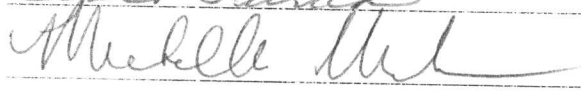






A MODEL OF TIME USE AT WORK: INDIVIDUAL DIFFERENCES, TIME USE,  
AND PERFORMANCE

by

Alicia Ann Stachowski  
A Dissertation  
Submitted to the  
Graduate Faculty  
of  
George Mason University  
in Partial Fulfillment of  
The Requirements for the Degree  
of  
Doctor of Philosophy  
Psychology

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## **Acknowledgements**

I would like to thank the many family, friends, and supporters who have helped me through this dissertation project. I am grateful for both the support and encouragement I received through this process. First, I could not have done this without the support of my family – my parents Shirley and Charlie Stachowski, and my sister Trisha. Thank you for your patience with me, for listening to me, and for simply being there from start to finish. I am also most appreciative for the help and endless encouragement from my advisor, Dr. Seth Kaplan. This project would not have been finished without you. I wish to sincerely thank Dr. Patricia Wanschura, Claire Cole, Lesley Ducenne, Ryan Ginter, Andre Garcia, Tracy McCausland, Sarah Klein, Heather Mullins, Peter Mullins, and Stephanie Wong for their invaluable assistance during the data collection phase of this project. I would also like to thank my other committee members, Lois Tetrick and Michelle Marks, for their insightful comments on the project. Finally, I need to thank friends Katherine Ryan and Luke Brooks-Shesler for their infinite emotional support and encouragement during all of graduate school.

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## **Abstract**

### **A MODEL OF TIME USE AT WORK: INDIVIDUAL DIFFERENCES, TIME USE, AND PERFORMANCE**

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George Mason University, 2011

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As jobs become more complex and autonomous, issues surrounding time use are becoming more important. At present, we know relatively little about how time-related individual differences influence how people choose to structure their time, and furthermore, how these choices impact task performance. Based on an interactionist approach, a model was proposed incorporating both person and situational variables associated with time use. Several time-related individual difference variables (i.e., time perspective, polychronicity, and time urgency) were expected to predict time use behaviors. Individual differences were hypothesized to relate differentially to time use dimensions (i.e., time management, pacing, and multitasking), and time use behaviors were hypothesized to relate to performance outcomes. Situational moderators (i.e., autonomy and time scarcity) were also examined. Ninety-four undergraduate students enrolled in a psychology research methods course tracked their progress on a final course

project once per week for four weeks leading up to the deadline. Self- and instructor-rated project grades served as performance measures. Findings provide some support linking time-related individual differences to time use dimensions. Specifically, future time perspective was positively related to time management. Polychronicity and time scarcity were positively correlated with multitasking. Situational variables (autonomy and time scarcity) moderated some of the time-related individual difference-time use relationships. Support was not found for the relationship between time use dimensions (i.e., time management, pacing, and multitasking) and performance. Implications for the workplace and future research directions are discussed.



## **Introduction**

As work changes, becoming more autonomous, complex, and technologically-driven (Burke & Cooper, 2006), issues surrounding time use are becoming more important. For example, some researchers have suggested that nearly every job requires at least some degree of multitasking (Bühner, König, Pick, & Krumm, 2006). While some attempt to “do more with less” by multitasking, others engage in non-work activities while on the job. A 2008 survey of 2,500 (mostly full-time) employees in the U.S. reported that 22% of respondents wasted approximately two hours of each workday, and an additional 14% wasted three or more hours (e.g., using the internet, making personal phone calls; Salary.com). Surprisingly, while the broad concept of time use is an inherent part of many aspects of work (e.g., long-range planning, distribution of tasks among team members, deadlines, interruptions), we know relatively little about how individual differences influence choices concerning structuring time, and how people choose to prioritize time throughout the workday. Individual differences in awareness of time, construal of time, and preferences for using time likely predict some of this variability and are thus important to our understanding of actual time use at work.

The purpose of this dissertation is to offer a model of time use linking time-related individual differences (i.e., time perspective, polychronicity, and time urgency) to dimensions of time use (i.e., time management, pacing, and multitasking), and task

performance. While the topic of time is gaining interest in the IO and management literatures (e.g., Ancona, Okhuysen, & Perlow, 2001; Roe, 2008), most of the relevant research comes from other disciplines approaching the topic from a variety of perspectives (e.g., economic value of time as a resource, Becker & Mulligan, 1997; team or group communication, Ballard & Seibold, 2004; marketing, Kaufman-Scarborough & Lindquist, 2003). To my knowledge, this is the first model testing the relationships between a number of individual time-related differences, time use dimensions, and performance. Related to this point, the majority of literature on time-related individual differences tends to focus on a single relationship (e.g., polychronicity and time management). By exploring a larger model, I aim to clarify the existing dimensions of time use at work (Ballard & Seibold, 2003, 2004; Schriber & Gutek, 1987) and their relationships with both individual time-related differences and performance (see Figure 1).

In general, people spend little time thinking about *how* they spend their time (Zimbardo & Boyd, 1999). In a practical sense, exploring a larger model of how time use preferences themselves relate to actual time use may provide a useful platform from which to examine tailored time use/management training. If conceptualization of, and preferences for, using time relate to different aspects of time use at work (e.g., preference for checking email constantly throughout the day rather than set times, working on tasks at the last minute), assessing time-related individual differences may be a valuable place to begin improving time use efficiency.

Toward these ends, I developed and tested a model incorporating both person and

situational variables described below (see Figure 1). The model begins with several time-related individual difference variables, namely time perspective, polychronicity, and time urgency. These individual differences in conceptualization of, awareness, and preference for using time are hypothesized to relate to actual time use behaviors. Typically, only a single aspect of time use is examined in a given study (e.g., “pacing”; Ariely & Wertenbroch, 2002, Gersick, 1988, or “multitasking”; König, Bühner, & Mürling, 2005). In contrast, the second component of the proposed model includes several dimensions of time use: time management, pacing, and multitasking. Two moderators of these individual difference – time use relationships are examined: perceived autonomy and time scarcity. Time scarcity, in addition, is expected to relate directly to some of the time use dimensions. Finally, and potentially of most practical importance, are the hypothesized connections among the time use behaviors and performance outcomes. Each of these terms, as well as the linkages in the model, will be described below.

### **Time-related Individual Differences**

Individual differences in perceptions of time and preferences for using time are important to our understanding of how people choose to structure their time (e.g., Conte, Schwenneker, Dew, & Romano, 2001). Three time-related individual differences are of interest in the present study: time perspective, polychronicity, and time urgency. These specific variables were selected for inclusion based on a factor analysis of 24 time-related individual differences and their likely relevance to time use at work (Francis-Smythe & Robertson, 1999a). Francis-Smythe and Robertson’s measure of “time personality” consists of five dimensions. Specifically, their dimensions of planning, polychronicity,

and impatience should be important in explaining differences in how people use their time to accomplish work. Because their scale has infrequently been used to date, constructs (and measures) consistent with their dimension descriptions (in some cases, instead of the actual construct names they chose) were used. See Table 1 for their described factors<sup>12</sup>.

Of note is that, while these time-related individual differences are associated with the Big Five personality dimensions (e.g., Conte, 1998; Conte & Gintoft, 2005; Conte & Jacobs, 2003; Zimbardo & Boyd, 1999), existing research also indicates that they contribute incremental predictive validity above the Big Five personality dimensions. For instance, polychronicity accounted for additional variance in lateness and absence in train operators beyond the Big Five (Conte & Jacobs, 2003). Moreover, it predicted sales performance, supervisor ratings of customer service, and overall performance of retail sales associates (Conte & Gintoft, 2005). I elaborate on the three time-related individual differences below.

### **Time Perspective**

Time perspective is the “degree of emphasis [people place] on the past, present, and future” (Bluedorn 2000, p. 124), and consists of the subjective focus, or frame, a person takes when making decisions and taking actions (e.g., Boniwell & Zimbardo,

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<sup>1</sup> Two dimensions were omitted: “leisure time awareness” consisting of time spent outside of paid work, and thus outside the scope of this project, and “punctuality”, which by definition is a part of the time urgency construct.

<sup>2</sup> Time urgency has components of both keeping to schedules and adhering to external deadlines (Conte, Landy, & Mathieu, 1995), and those high in time urgency have been shown to be punctual to work (Dishon-Berkovits & Koslowsky, 2002).

2003). In line with the majority of current literature, I conceive of time perspective as dimensional rather than as one continuum (Hofstede & Bond, 1988). Research on time perspective as an individual difference has focused on present and future perspectives when studied in the context of work and organizations (Zimbardo & Boyd, 1999). Waller, Conte, Gibson, and Carpenter (2001) note that these two perspectives are often emphasized in organizational research because of their impact on decision-making and performance (e.g., West & Meyer, 1998). Furthermore, the literature on the planning fallacy (Kahneman & Tversky, 1979) suggests that when evaluating the time needed to complete a task, people rarely consider past experiences and performances, rather electing to focus on future thoughts of how the task might be completed. Buehler, Griffin, and Ross (1994) demonstrated that people, in fact, constructed narratives of how future events would unfold without contemplating past experiences. When they *did* evaluate past behaviors, it was typically to confirm an exception (i.e., extenuating circumstances). As such, I examine both present and future time perspectives here.

Time perspective influences a person's expectations, goals, and imagination (Boyd & Zimbardo, 2005) by becoming the (temporal) frame from which to view the world. People scoring high on the present perspective dimension focus on the "here and now," attending to immediate goals. Because of this more narrow time lens, people high on present time perspective have a tendency to believe that planning is not useful, are more likely to behave impulsively, and often lose track of time (Zimbardo & Boyd, 1999). In contrast, a high score on future time perspective is associated with a more long range time lens, or cognitive frame. As the name implies, a person with this focus thinks

about a larger scope or span of time. Those high on future time perspective engage in more goal-directed behaviors and imagining or envisioning an ideal future world (Boniwell & Zimbardo, 2003). People high in a future perspective tend to believe that present behaviors will have an influence on future goals and accomplishment of those goals (Jones, 1988). They are inclined to create to-do lists, maintain a daily planner, carry a watch, and define and set goals (Zimbardo & Boyd, 1999).

### **Polychronicity**

Polychronicity was first introduced by Hall (1959) and expanded upon by Bluedorn, Kalliath, Strube, and Martin (1999) who defined it as, “the extent to which people prefer to be engaged in two or more tasks or events simultaneously, and believe their preference is the best way to do things” (p. 207). With the escalating interest in multitasking in the workplace (König, Oberacher, & Kleinmann, 2010), polychronicity may have important implications for how people use their time and perform their work, especially under circumstances in which they are required to manage multiple responsibilities simultaneously (Onken, 1999). Concerning the stability of this trait, Bluedorn et al. (1999) reported test-retest reliability coefficients of 0.89 in a sample of 23 managers over a two-week period, and 0.78 in an additional 21 managers over a month using the Inventory of Polychronic Values.

Given the conceptual similarity between polychronicity and multitasking, noting the distinction between the two is important. König and Waller (2009) recommend using the term “polychronicity” only when describing the preference for working on several things at the same time. The term “multitasking”, however, should be applied to the

*behavior* of engaging in multiple tasks at the same time. I follow this recommendation in describing the individual difference as a preference, which is thought to predict actual behavior.

### **Time Urgency**

The third time-related individual difference of interest is time urgency. The concept of time urgency is a component of the Type A behavior pattern (Friedman & Rosenman, 1974) and is defined as a “frequent concern with the passage of time”<sup>3</sup> (Waller et al., 2001, p. 589). People high in time urgency have a tendency to construe time as a scarce resource, and as such, plan its use carefully (Landy, Rastegary, Thayer, & Colvin, 1991). Time urgency has previously been of most interest in predicting coronary heart disease and stress (e.g., Bond & Feather, 1988; Ganster, Schaubroeck, Sime, & Mayes, 1991) and has thus been heavily studied in the area of work stress and health (e.g., Friedman & Rosenman, 1959; Mohan, 2006). However, this individual difference has also been studied in the performance-related literature, as it has been associated with perceptions of deadlines, time awareness, and perceived rate at which tasks should be performed (Landy et al., 1991).

Landy and colleagues’ (1991) original five factor structure of time urgency was confirmed by Conte, Ringenbach, Moran, and Landy (2001), who found the same dimensions using a sample of 393 travel agents. Three of the five dimensions are of

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<sup>3</sup> It should be noted that time urgency is distinct from time pressure (or temporal urgency; Zaccaro, Gualtieri, & Minionis, 1995). In contrast to an internal sense of time urgency, time pressure is situational, external and creates situations of varying time constraints (Rastegary & Landy, 1993). The individual difference of time urgency is often confused with a situation of time urgency or the experience of not having enough time (e.g., Blatchley et al., 2007).

interest in this study: competitiveness, task-related hurry, and general hurry. Speech patterns and eating behavior are not expected to relate to task work and performance, and as such, will not be discussed further. Landy et al. (1991) reported the following test-retest reliability coefficients for a sample of 132 clerical workers over four months: competitiveness (0.93), task-related hurry (0.95), and general hurry (0.90).

### **Time Use**

As seen in the model in Figure 1, the individual differences discussed above are expected to relate to actual time use ( $H_1 - H_8$ ). Previous studies have described dimensions of time use from cultural (Schriber & Gutek, 1987), communication (Ballard & Seibold, 2003, 2004), and organizational (Benabou, 1999) perspectives. The current study is, to the best of my knowledge, the first attempt at empirically testing the relationships among a variety of time-related individual differences, time use dimensions, and performance.

I explore several time use dimensions, building upon the existing studies of time dimensions at work. Schriber and Gutek (1987) previously examined time dimensions of work applied to organizational culture, describing 13 unique aspects of time in organizations (i.e., schedules and deadlines, punctuality, future orientation, time boundaries between work and nonwork, quality versus speed, synchronization and coordination of work with others through time, awareness of time use, work pace, allocation of time, sequencing of tasks through time, intraorganizational time boundaries, autonomy of time use, and variety versus routine). More recently, Ballard and Seibold (2003, 2004) described ten dimensions of time in organizations within the context of



communication among organizational members. Broad categories include *time construal* (i.e., “the way work group members interpret or orient to time”, p. 141) and *enactment of time* (i.e., “the way work group members perform time”, p. 140). Their construal dimensions included scarcity, urgency, and time perspective. Time enactment included dimensions of flexibility, linearity, pace, precision, scheduling, and separation. In line with Ballard and Seibold (2003, 2004), I distinguish among time-related individual differences and actual time use behaviors.

The time use dimensions examined in the current study are time management (i.e., the degree to which employees take into account the planning and scheduling of tasks/workday), pacing (i.e., the manner in which they pace task-related activity from project start to end date) and the number of tasks they choose to work on at a given time (multitasking). I incorporate relevant time use dimensions described by Ballard and Seibold (2003, 2004) and Schriber and Gutek (1987) here, excluding variables outside the scope of this study (e.g., boundaries between work and nonwork). I elaborate on each of these dimensions below and, in doing so, link the three individual differences to them in proposing the study hypotheses. Prior to discussing how each of the three time-related individual differences is related to time use, a brief description of each time use dimension is provided.

### **Time-Related Individual Differences & Time Use**

#### **Time Management**

The first of these dimensions is time management. The idea of time management is founded on the assumption that recording and managing time has the potential to help a

person effectively deal with his or her time (Drucker, 1966). I follow Koch and Kleinmann (2002) in defining time management as, “the self-controlled attempt to use time in a subjectively efficient way to achieve outcomes” (p. 201). This definition highlights three important components of time management implied in much of this literature. First, some level of choice in how to use one’s time is necessary for time management to have meaning. Second, time management behaviors are intended to achieve some goal, and third, efficiently.

I focus on two of Macan, Shahani, Dipboye, and Phillips’s (1990) dimensions of time management (i.e., setting goals and priorities, and mechanics)<sup>4</sup>. The setting goals and priorities factor is intended to tap the setting of goals a person wants or needs to accomplish and prioritizing the tasks necessary to achieve those goals. The mechanics factor is intended to tap behaviors such as making lists and planning. While training does not consistently increase time management behaviors (Macan, 1996), Claessens, van Eerde, Rutte, and Roe (2007) recently posited that certain personality traits might act as antecedents to time management. I explore this possibility below, offering hypotheses linking time-related individual differences of time perspective, polychronicity, and time urgency to time management.

**Time Perspective and Time Management.** As seen in Figure 1, the first individual difference expected to relate to time management is time perspective. Time perspective is thought to shape a person’s expectations, goals, and imagination (Boyd &

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<sup>4</sup> Note that Macan et al. (1990) uncovered a third factor not explored in the current study: preference for organization. As this dimension taps preference, as opposed to behavioral items, it was not included here.

Zimbardo, 2005). Waller et al. (2001) suggest that time perspective may influence how individuals behave in regard to time, whereby a person's perspective becomes a temporal cognitive frame. In turn, this cognitive frame influences planning behaviors and engagement in certain activities. Present time is often associated with the perception that planning is not useful (Zimbardo & Boyd, 1999). Time management behaviors include planning and prioritizing tasks yet to be accomplished. As someone high on present perspective tends to view future behaviors as unrelated to goal accomplishment, it seems likely that present time perspective would be negatively related to time management. As such, the following hypothesis is offered.

*H1: Present time-perspective is negatively related to time management behaviors.*

Future time perspective, on the other hand, has been called "big picture" thinking (Fortunato & Furey, 2009) in that it provides people with the ability to imagine future possibilities. A long-term, goal-focused perspective, in turn, should be related to each of the time management behaviors. Related studies lend support to this idea. For example, Murrell and Mingrone (1994) found that students with a high future time perspective focused on success through goal-directed behaviors, participating in many activities to work toward/achieve their goals. In addition, more recent results suggest a future perspective predicts academic engagement (Horstmanshof & Zimitat, 2007) and less procrastination (Díaz-Morales, Ferrari, & Cohen, 2008), which are indicative of more planning behaviors. As time management consists largely of goal-directed activities, future orientation should be positively associated with time management behaviors.

*H2: Future time-perspective is positively related to time management behaviors.*

**Polychronicity and Time Management.** Next, the relationship between the individual difference of polychronicity and time management is explored. Empirical research lends some support to a positive relation between polychronicity and time management behaviors. Wastag and Conte (2009) suggest that polychronicity is positively related to general hurry, which is associated with a tendency to plan too much to do in too little time (Rastegary & Landy, 1993). Wastag and Conte (2009) further suggest that someone with a polychronic tendency (upon discovering that they do not have sufficient time) will attempt to make up for “lost” time by working on multiple activities at once, leading to additional planning and scheduling. Worth noting is that these efforts may be inversely related to actual effectiveness in following through with plans. Kaufman-Scarborough and Lindquist (1999) found that monochronic individuals enjoyed planning their daily activities so that they knew when to do each task, but had more trouble organizing what they had to accomplish and managing changes to their schedule than those on the polychronic end of the spectrum. Given the above evidence, I expect that polychronicity relates positively to engaging in time management behaviors.

*H3: Polychronicity is positively related to time management behaviors.*

**Time Urgency and Time Management.** Finally, time urgency is expected to relate positively to time management behaviors. Some empirical and theoretical studies indirectly suggest that a positive association between time urgency and time management behaviors is probable. Recall that time urgency consists of a focus on the passage of time and that this variable affects perception and use of time (Rastegary & Landy, 1993). Strube, Deichmann, and Kickham (1989) concluded that individuals high in time urgency

have a tendency to be more attentive to time and deadlines than those low in time urgency. Moreover, Waller, Giambatista, & Zellmer-Bruhn (1999) found that time urgent individuals had a tendency to impose strict schedules on their team members, suggesting a relationship with planning and scheduling dimensions of time management. Furthermore, time urgent members pushed their team members to focus on one task at a time, and frequently reminded teammates of the approaching deadline (Waller et al., 1999). While not explicitly tested, pushing members to focus on the task at hand could be construed as prioritizing that task over others. Moreover, in a theoretical piece considering both time perspective and time urgency, Waller et al. (2001) posit that time urgent individuals with a future time perspective will exhibit achievement striving, high time awareness, and a need to schedule. Given the above findings and ideas, I expect that time urgency is positively associated with engaging in time management behaviors.

*H4: Time urgency is positively related to time management behaviors.*

In addition to the quantity of time management behaviors, the accuracy of planning and scheduling behaviors may also be meaningful in predicting performance. In the current conceptualization, accuracy in estimating the time needed to complete work tasks is regarded as a measure of efficiency, in that more accurate estimates should result in the best use of one's time. In general, findings concerning people's accuracy in estimating time are mixed. Burt and Kemp (1994), for example, found that people tended to overestimate the amount of time necessary to complete tasks. Francis-Smythe and Robertson (1999b), however, demonstrated the opposite result, finding that a large number of participants underestimated how long a task would take to complete. I

examine the accuracy of time management in the form of precision of task duration estimates in an exploratory manner here.

## **Pacing**

As seen in Figure 1, the second dimension of time use explored in this dissertation is that of pacing. People differ in their pacing of work tasks. Whereas some people seem to struggle to meet deadlines, others seem to have methods of effectively pacing themselves before an upcoming a deadline (e.g., Gevers Claessens, van Eerde, & Rutte, 2009). Moreover, sometime people elect to start a new project immediately upon receiving instruction, and in other instances wait. I conceptualize pacing here as a behavior consisting of *when* a person chooses to work on a task (as opposed to the *rate* at which a task is completed (e.g., Levine, 1988; Okhuysen & Waller, 2002; Schriber & Gutek, 1987)<sup>5</sup>. For example, when learning of a project due in five business days, one person could choose to construct a full draft on the first day and spend a small amount of time reviewing it the day before the deadline. This choice of pacing can be contrasted with someone who instead elects to work on small portions of the project each day leading up to the deadline.

Pacing is associated with both monitoring the passage of time and of an awareness of deadlines (Waller, Zellmer-Bruhn, & Giambatista, 2002). Recently, the idea that there may be individual differences in pacing style was proposed. Gevers, Mohammed, Baytalskaya, and Beeftink (2008) refined the conceptualization of types of

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<sup>5</sup> There two related ways to think about work pace: the speed or *rate* at which individuals work, and *when* they do so.

work pace, concluding pacing could be categorized into different types, which I examine in the current study. They include: “steady action” in which the work is completed at a steady pace throughout, spreading work out evenly from the start of a project to the deadline; “u-shaped/curvilinear” in which more effort is put forth at the beginning and end of the allotted time (Claessens, 2004), “deadline action” in which most of the work is done immediately preceding a deadline, and “early action” which refers to a pattern in which someone starts activities early and ensures that the work is finished long before an approaching deadline (Gevers et al., 2008). While these authors have begun to examine pacing as a stable preference, I explore it here as behavior. Below, I offer hypotheses linking time-related individual differences to pacing.

**Time Perspective and Pacing.** First, present and future time perspectives are hypothesized to relate to pacing differently. High present time perspective is expected to be most strongly associated with deadline action pacing. Because someone high on this dimension tends to believe that planning is not particularly fruitful and also tends to lose track of time (Zimbardo & Boyd, 1999), he or she is not expected to take an early action approach. Rather, it is expected that when considering how to use their time, people high on this dimension would instead focus on only the most pressing deadlines.

*H5a: Time perspective is related to pacing such that present time perspective is positively associated with the deadline action pacing.*

A person scoring high on future time perspective is expected to select pacing behaviors further from a deadline. Because people high on this dimension tend to be more goal-directed (Boniwell & Zimbardo, 2003) and believe that present behaviors will

have an influence on goal accomplishment (Jones, 1988), future time perspective is expected to be positively associated with more planned pacing approaches. More specifically, in considering future consequences, making plans, and setting goals (Zimbardo & Boyd, 1999), people high on future time perspective should be more likely to select an early or steady pace.

*H5b: Time perspective is related to pacing such that future time perspective is positively associated with both early and steady pacing.*

**Polychronicity and Pacing.** Polychronicity is not expected to relate particularly strongly to any one of the distinct pacing categories, as solid theoretical support for why a person high in this trait would select one particular pattern of pacing over another is lacking. While polychronicity has been shown to be negatively associated with other related forms of timing (e.g., punctuality, Benabou, 1999), the pattern or pace of time use of is of most interest here. As such, a specific prediction is not made.

**Time Urgency and Pacing.** However, I do predict a relationship between time urgency and pacing. In a theoretical paper, Waller and colleagues (2001) suggested that time urgency may interact with time perspective to predict group performance for different types of deadlines. As individuals high in time urgency have a tendency to be more attentive to time and deadlines than those low in time urgency (Strube et al., 1989), it is expected that someone high on time urgency would elect to finish tasks early. A focus on deadlines seems likely to lead to self-imposed pressure to finish a task on time. In support of this notion is Waller et al.'s (1999) finding that those high in this trait tend to push team members to stick to a schedule, including reminding them of an upcoming



deadline. As such, the following hypothesis is offered regarding time urgency and work pace type.

*H6: Time urgency is positively related to the early action pacing type.*

## **Multitasking**

The third time use dimension explored here is multitasking. A variety of definitions of multitasking exist in the literature. These definitions tend to focus on either the *ability to* multitask (e.g., “ability to manage and execute multiple and concurrent tasks”, p. 101; Salvucci & Taatgen, 2008, “ability to accomplish multiple task goals in the same general time period by engaging in frequent switches between individual tasks”, p. 1; Delbridge, 2000), or on the *performance* (i.e., behavior) of engaging in multiple tasks (e.g., “engaging in multiple tasks or assignments simultaneously”, p. 339; Ishizaka, Marshall, & Conte, 2001). Here, a definition of multitasking behavior was borrowed from Oswald, Hambrick, Jones, and Ghumman (2007), who stated that multitasking is behavior that entails performing multiple tasks, that requires shifts in attention, and that occurs *over a short period of time*. This particular conceptualization was chosen because of its acknowledgement of attention, which is central to the theoretical rationale below, as well as the emphasis on task work. In the following sections, I propose hypotheses relating the time-related individual differences to multitasking.

**Time Perspective and Multitasking.** First, time perspective is not expected to relate to multitasking behavior. Time perspective itself appears to relate more so to decisions concerning *when* to do work, as opposed to the number of tasks to perform at one time. Situational constraints aside, there is not a strong theoretical rationale for

predicting a positive or negative relationship between standing on present or future time perspectives and multitasking.

**Polychronicity and Multitasking.** Polychronicity, on the other hand, is expected to relate positively to multitasking behavior. There is growing support for the relationship between polychronicity and multitasking. Zhang, Goonetilleke, Plocher, and Liang (2005), for example, conducted a lab study in which they asked participants to monitor and control two processes at the same time. Switching back and forth is indicative of multitasking because it entails engaging in a number of tasks during the same period (Bluedorn, 2002). Zhang and colleagues (2005) found that those with a monochronic orientation attempted to control the tasks serially, while those with a polychronic orientation attempted to control both processes simultaneously. Furthermore, a recent study found that polychronicity predicted both the enjoyment of a “multitasking” simulation, as well as the number of tasks on which participants chose to work (Poposki & Oswald, 2010). As such, Hypothesis 7 is an attempt to replicate a general positive relationship between polychronicity and multitasking.

*H7: Polychronicity is positively related to multitasking.*

**Time Urgency and Multitasking.** I also predict a positive relationship between time urgency and multitasking. Time urgency relates to an intense focus on one’s present task. Owing to their focus on the passage of time, those high on time urgency report experiencing being agitated and restless during “downtime” (Frankenhaeuser, Lundberg, & Forsman, 1980) and are uncomfortable with even brief moments of inactivity (e.g., wasting time by taking breaks or relaxing; Price, 1982). As such, they often attempt to fill

all spare time with achievement-oriented (by extension, work-related) activities (Price, 1982). This self-imposed time pressure means that a person must be highly attentive to work tasks during all available time. As such, people high on this trait are expected to fill their time with multiple work-related activities simultaneously or during moments of downtime whenever possible.

*H8: Time urgency is positively related to multitasking.*

### **Moderators of Individual Differences – Time Use Relationship**

This study attempts to capture both individual and situational predictors of time use using an interactionist approach, which refers to the combined influence of both personality and situational variables on attitudes, behaviors, cognitions, and emotions (Endler & Magnusson, 1976). Context is an integral component of this model. In light of the time dimensions described above, two relevant time-related variables are of interest in their likely influence on the relationships between the individual differences and time use: perceived autonomy and time scarcity. Above, I outlined the manner in which three time-related individual difference variables are expected to relate to time use behaviors. The next two hypotheses concern the possible direct influence of a contextual variable (perceived time scarcity) on time use (See Figure 1, H<sub>9</sub>-H<sub>10</sub>). Following this discussion, perceived time scarcity and autonomy are explored as moderators of the time-related individual difference-time use relationships.

### **Time Scarcity**

Time scarcity is defined as the perception of time as both a limited and exhaustible resource (Karau & Kelly, 1992). Thus, a *time scarce* situation (or perception)

is one in which there exist too many tasks to complete in a given amount of time (McGrath & Kelly, 1986). I suggest that the perception of time scarcity is positively related to engaging in time management behaviors. More specifically, as a person perceives a greater sense of time scarcity, his or her attempt to plan remaining time likely increases<sup>6</sup>.

*H9: Time scarcity is positively related to time management behaviors.*

Furthermore, in a situation in which time scarcity is experienced, a direct relationship is expected between time scarcity and multitasking such that the greater the perception of time scarcity, the more likely a person engages in more tasks simultaneously (e.g., taking a business call while attempting to respond to email) in an attempt to “catch up” on work and reduce the sense of time scarcity (see Wastag and Conte (2009) for a similar rationale). As such, time scarcity is expected to relate positively to multitasking.

*H10: Time scarcity is positively related to multitasking.*

### **Perceived Autonomy**

Autonomy is a situational component, defining the “strength” of the situation (Mischel, 1977). *Scheduling* autonomy, specifically, is of interest in this study, which includes discretion over scheduling, sequencing, and timing of work (Breugh, 1989).

Considering time management as an example, by definition this dimension of time use

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<sup>6</sup> Note that perception is meaningful here, as people with excessive demands may feel comfortable with their “time supply” because they are skilled at organizing or efficiently using time, or simply feel at ease with their time supply (Kaufman-Scarborough & Lindquist, 2003). In contrast, other people with relatively fewer demands may experience elevated time scarcity because they are unskilled at using their time or perpetually feel short on time.

implies that employees have some decisive power in how they schedule work activities (Koch & Kleinmann, 2002). Thus, in a strong situation, managing time should relate only weakly to preferences<sup>7</sup>. The work happens in a predetermined fashion and pace.

The relationships between time-related individual differences and time use dimensions are expected to become stronger with increasing levels of autonomy. First, the associations between time perspective dimensions (i.e., present and future time perspective) and time use behaviors are expected to increase with greater levels of autonomy such that for someone high in present time perspective, fewer time management behaviors are expected, along with later pacing of a task (i.e., working on the majority of the work even closer to the deadline). For someone high in future time perspective, more time management behaviors are expected, along with an earlier pacing of a task. Consequently, someone high on the future time perspective dimension is expected to engage in more time management behaviors and earlier pacing of work with greater perceived choice in scheduling work (i.e., greater autonomy).

Similarly, autonomy is also expected to strengthen the relationship between polychronicity and time use dimensions. As someone high on polychronicity prefers to plan and to work on multiple tasks in a given amount of time, greater autonomy should result in more of these behaviors.

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<sup>7</sup> For instance, take a project manager high on future time perspective expected to engage in many planning and scheduling behaviors. This person, with a high level of autonomy, may plan to visit “X” number of project sites on Monday, create a specific route (i.e., schedule) to visit each of them throughout the day as efficiently as possible. A project manager high on present time perspective, on the other hand, may haphazardly decide to do site visits on Monday, but fail to map out an efficient plan for how to accomplish the work during the day.

Finally, autonomy is expected to increase the association between time urgency and the time use dimensions of time management, pacing and multitasking. The rationale for proposing the strengthened relationships here is similar to that of the other two time-related individual differences, in that increased choice in how to use one's time should result in time use based more heavily on individual preferences. In this case, time urgency should be associated with more time management behaviors, earlier pacing, and more multitasking. (See Figure 1, H<sub>11</sub>). Thus, the following group of hypotheses is offered.

*H11a: The relationships between the present and future time-perspectives and time management become stronger as autonomy increases.*

*H11b: The relationships between the present and future time-perspectives and pacing become stronger as autonomy increases.*

*H11c: The relationship between polychronicity and time management becomes stronger as autonomy increases.*

*H11d: The relationship between polychronicity and multitasking becomes stronger as autonomy increases.*

*H11e: The relationship between time urgency and time management becomes stronger as autonomy increases.*

*H11f: The relationship between time urgency and pacing becomes stronger as autonomy increases.*

*H11g: The relationship between time urgency and multitasking becomes stronger as autonomy increases.*

## **Time Scarcity**

The relationships between time-related individual differences and time use dimensions also are expected to change with increasing levels of time scarcity, in some instances becoming weaker, in others stronger. I first explore time scarcity's proposed influence on the predictions relating to the individual difference variable of time perspective. First, as time scarcity increases (people perceive too much to do with too little time), the relationship between time perspective and time management may be *reduced*, as time scarcity may motivate planning and scheduling behaviors, regardless of time perspective. In contrast, there is little evidence to support a change in pacing behavior (i.e., *when* work happens as opposed to *rate*) as a result of increased time scarcity, nor is there compelling evidence to support a change in the behavior of present versus future focused perspectives in their tendency to multitask.

Time scarcity also should play a role in predictions relating to the individual difference variable polychronicity. The relationship between polychronicity and time management is expected to *strengthen* with increased time scarcity. Someone high in polychronicity tends to plan more than he or she can complete in the allotted time (Rastegary & Landy, 1993). Wastag and Conte (2009) describe a type of spiral in which, upon discovering insufficient time to complete a task, polychronic people attempt to make up for "lost" time by working on more than one thing at once, leading to more planning and scheduling. The experience of increased time scarcity is thus expected to exacerbate this relationship. A comparable hypothesis is made concerning the time use dimension of multitasking for the same reasons. I hypothesize that time scarcity

*strengthens* this link such that as time scarcity increases, the relationship between polychronicity and multitasking becomes stronger.

Lastly, I explore its influence on the predictions relating to the individual difference variable of time urgency. I predict that with perceived time scarcity, the relationship between time urgency and time management will be *stronger*. Recall that one finding from the team literature showed that time urgent team members urged other group members to focus on the single task at hand as deadlines approached (Waller et al., 1999). With less perceived time, those high on time urgency should engage in more planning behaviors. The same rationale applies to that of the pacing of work such that under time scarce circumstances, a time urgent person is more likely to select earlier pacing of work than under less time urgent circumstances. Finally, I suggest that time urgency will be *negatively* associated with multitasking under perceptions of time scarcity, as evidence from research on teams shows that time urgent individuals aim to focus on one task when the deadline approaches (Waller et al., 1999). Thus, the following group of hypotheses is offered with respect to the moderating effect of time scarcity.

*H12a: The relationships between present and future time-perspectives and time management become weaker as time scarcity increases.*

*H12b: The relationship between polychronicity and time management becomes stronger as time scarcity increases.*

*H12c. The relationship between polychronicity and multitasking becomes stronger as time scarcity increases.*

*H12d. The relationship between time urgency time management becomes stronger*



*as time scarcity increases.*

*H12e. The relationship between time urgency pacing becomes stronger as time scarcity increases.*

*H12f. The relationship between time urgency and multitasking becomes negative as time scarcity increases.*

### **Performance Outcomes**

Organizations are ultimately interested in performance outcomes. While it is inherently interesting to consider questions surrounding the manner in which people's time preferences and construals influence their time use behaviors, of more practical use is how these concepts relate to performance outcomes. As seen in Figure 1 (H<sub>13</sub>-H<sub>15</sub>), time use is expected to relate to task performance, operationally defined in this context as instructor-rated assessment of performance (i.e., grades from instructors) and as self-rated performance on a research proposal.

Existing literature lends some support for the relationship between time use dimensions and performance outcomes. For example, Lim and Seers (1993) found that future time perspective, autonomy of time use, and allocation of time together predicted the performance of managers. Moreover, Gersick (1989) found that groups with more successful midpoint transitions performed better than those who less successfully paced their work time. In other words, the manner in which people use time seems to relate to performance outcomes. However, our understanding of the time use-performance relationship could benefit from additional evidence. Thus, the current study aims to provide further support relating time use and performance outcomes (e.g., Britton &

Tesser, 1991; Gersick, 1989; Law, Logie, & Pearson, 2006).

### **Time Management and Performance**

A positive relationship is expected between engaging in time management behaviors and performance. While the theoretical framework describing how time management should relate to outcomes is limited, Claessens, van Eerde, Rutte, and Roe (2010) state that time management is a unique form of self-regulation (Kuhl & Fuhrmann, 1998) in which people cycle through a process of goal establishment, planning, striving, and revision. They further explain that a key component of action regulation theory is the assumption that planning is necessary for successful action (e.g., goal accomplishment, or performance in the current study). As such, time management should be positively related to later task performance.

Interestingly, though, findings are mixed concerning this intuitive link between time management and performance. For example, while Macan (1994) found no relationship between time management and performance, other empirical work demonstrates support for this link. Positive relationships have been found between time management and objective GPA (Britton & Tesser, 1991) and self-perceived organizational performance (Lim & Seers, 1993). Others have found certain dimensions of time management are related to performance. For instance, Claessens et al. (2004) found that the *planning behavior* dimension of time management was related to higher job performance. Barling, Kelloway, and Cheung (1996) found that short-range planning interacted with achievement striving to predict job performance of car salespeople. While at least one study did not replicate this relationship, the author suggested that these null

findings may have been due to sample specific findings, and time management's relationship with different aspects of performance. Thus, given the weight of the evidence, I aim to replicate the positive relationship between time management and performance outcomes.

*H13: Time management is positively related to performance.*

### **Pacing and Performance**

I suggest that the various forms of pacing are differentially related to performance; specifically that later pacing is less effective than other forms of pacing. Prior research suggests that people's interpretation of deadlines (i.e., temporal schemata; Labianca, Moon, & Watt, 2005) can influence how they pace their work to accomplish a goal. Support for this assertion comes from research on group pacing, or timing, of activity. For example, Gersick (1989) discussed findings of group pacing, concluding that successful groups proceed through a "punctuated equilibrium" from one phase of work to another. Teams in her study were able to accurately pace the two components (stages) of their task over time to allow for sufficient time to complete each of them. Her work suggests that the timing or pacing of work has implications for performance outcomes. In a related vein, there exists a large literature on the nature and negative consequences of procrastination, (e.g., Ariely & Wertenbroch, 2002; Moon & Illingworth, 2005). As such, it is expected that the "early," "steady," and "curvilinear" pacing lead to better performance than the "deadline" action pacing.

*H14: Pacing is related to task performance such that early action, steady and curvilinear pacing are associated with the highest task performance.*

## **Multitasking and Performance**

Finally, I suggest that multitasking is negatively related to task performance. Broadly speaking, research suggests that multitasking often changes (decreases) a person's focus. For example, the human performance literature provides convincing evidence of reduced driving performance while using a cell phone (e.g., Charlton, 2009), or attempting to break when doing a secondary task in a driving simulator (Levy & Pashler, 2008). Leroy (2009) provided clarity to the multitasking-performance relationship when she found that people have difficulty in switching their attention to a second task, particularly if they have not finished the first one. It is this attentional component (i.e., higher mental workload) that is often found to relate to decrements in performance. Law et al. (2006) examined the impact of engaging in a secondary auditory task *while* attempting to efficiently run errands in a virtually-simulated building, also finding a decrease in performance when people performed both tasks as opposed to one. Military studies also support this assertion. In a recent study using a simulated gunner environment, researchers found that performance declined when participants concurrently attempted to monitor, manage, or teleoperate an unmanned ground vehicle (Chen & Joyner, 2009). The above research suggests that in general, performance suffers when attention is divided among different tasks, as the ability to focus is reduced. I aim to provide further support for this finding.

*H15: Multitasking is negatively related to task performance.*

## **Method**

### **Overview**

A list of hypotheses is provided in Table 2. To test these predictions, I conducted a study tracking student time use on a class project over approximately one month. The general procedure consisted of tracking the time use of undergraduate psychology students as they worked toward the completion of a research proposal in a psychology research methods course. Students began by completing a battery of individual difference measures, and answering demographic questions. They were subsequently surveyed once per week for each of the four weeks leading up to the research proposal deadline. On the due date of the research proposal, students were asked to complete additional measures concerning their time use during the project as well as to provide information on their perceived performance. Finally, they were asked to complete the time-related individual difference measures a second time to establish test-retest reliability. Table 3 summarizes when each of the measures was administered. Data collection took place between February 28<sup>th</sup> and May 4<sup>th</sup> 2010, with a few remaining surveys submitted through May 8<sup>th</sup>.

### **Participants**

The sample consisted of 95 undergraduate psychology students enrolled in a psychology research methods courses during the spring semester of 2010 recruited via class announcement and department research participation website. Nine students were

missing one or more of the surveys (9.5%), but were retained in analyses for which they provided data. This sample was selected in part because it was possible to track a relatively large group of students as they worked on the same project. Students were sampled because variability in time use was necessary to observe differences, and academic work is considered to be highly flexible (Starkey, 1989). SAT scores were requested, but an oversight in the wording of the question made the results uninterruptible (i.e., specifying whether the score was created from the old or new system). Table 4 contains summary demographic information.

## **Measures**

### **Predictors & Moderators of Time Use**

**Time perspective.** The Zimbardo Time Perspective Inventory (ZTPI, 1999) was used to measure time perspective. Responses to the 37 items reflecting present and future perspectives were made on a 5-point Likert-type scale ranging from 1 (very untrue) to 5 (very true). Note that I collapsed across the present time perspective dimensions (i.e., present-hedonic and present-fatalistic) to arrive at a single “present” dimension. Please see Appendix A for all measures and items. Table 5 contains reliability information for each of the measures.

**Polychronicity.** Two measures of polychronicity were used. Poposki and Oswald’s (2010) Multitasking Preference Inventory contains items specifically aimed at tapping time use preferences (versus actual multi-tasking behavior), which is consistent with a recommendation offered by König and Waller (2009). Participants rated 14 items on a Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree).

As the measure above was unpublished, an additional measure of polychronicity also was used. Bluedorn, Kalliath, Strube, and Martin's (1999) Polychronic Values Inventory is a commonly used 10-item scale of polychronic preferences. Respondents made ratings on a Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). Results for both scales are reported separately.

**Time urgency.** Landy, Rastergary, Thayer, and Colvin's (1991) Time Urgency measure was used to assess time urgency. The three dimensions used here were: general hurry, task hurry, and competitiveness (14 items total). Respondents made ratings on a Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree).

**Personality.** Personality was included for the purposes of ensuring that the time-related individual differences provided additional variance in predicting time use beyond the Big Five personality factors. Personality was assessed with Saucier's (1994) 40-item Mini-Marker scale. This scale lists trait-descriptive adjectives for each of the Big Five traits (i.e., extraversion, agreeableness, conscientiousness, emotional stability and intellect/openness). Items were rated on a scale of 1 (very inaccurate) to 5 (very accurate).

**Autonomy.** The scheduling dimension of Breugh's (1989) Work Autonomy Scales was used to assess perceived autonomy. This three-item scale was intended to capture perceived autonomy in scheduling (i.e., extent to which a person feels he or she has discretion over the scheduling, sequencing, and timing of work activities). Items were rated on a 5-point scale ranging from strongly disagree to strongly agree.

**Time scarcity.** Subjective time scarcity was assessed using a modified version of

the 6-item Time Supply Scale (TSS; Kaufman & Lane, 1997), which is a subset of items taken from Reilly's Overload Scale (1982). Responses were made on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree).

**Attentional Control.** To distinguish between those who multitasked because they elected to and those who had a difficult time focusing, a measure of attention was included as a control variable. The Attentional Control component of the Adult Temperament Questionnaire (Rothbart, Ahadi, & Evans, 2000) consists of 6 items intended to tap "attentional focus" and "attentional shift". Responses were made on a 5-point Likert-type scale ranging from very untrue to very true.

### **Time Use Behaviors**

**Time Diary.** The weekly time use survey was created for the purpose of this study. Students were asked weekly to report on their time use behaviors for the previous week (i.e., since their last class). They were asked specifically about their *progress on their research proposals*. Students were asked to report: which days of the previous week, if any, they worked on their proposals, about the percentage of the project completed at that point, the amount of progress made (i.e., more, equal to, less than expected), and if less than expected, the reason for the deviation (see Table 6).

**Multitasking.** Interest in the current study was on whether or not people chose, or attempted to, multitask when given a choice in how they completed their work. König and colleagues (2010) described a 4-item measure intended to tap multitasking performance. The scale was validated using 192 participants, who were presented with three scenarios in which they could elect to complete tasks in a sequential or



simultaneous fashion. Choices were correlated with multitasking. All were significant: .39, .26, and .27 ( $p < .01$ ). A principal component analysis revealed one factor explaining 58% of the variance.

While a useful place to begin, this measure did not tap the attentional aspect of multitasking. Attention is important as not all multitasking requires additional cognitive effort (e.g., chewing gum and composing an email). Performance decrements logically seem more likely in situations where attention is necessary for two or more tasks. As such, I added two questions to the existing measure: “My focus was divided between two or more tasks”, and “Switching among tasks made it difficult to concentrate on any of them”. See Appendix B for psychometric properties of this measure.

König and Waller (2009) recommend explaining to participants what is meant by “at the same time” and by “a task” when measuring multitasking. Thus, the instructions read, “*While* I worked on my research methods 301 research proposal since my last lab,....[item stem]”. Multitasking was measured by asking participants to report this behavior as part of the weekly time diary surveys. This resulted in a multitasking score for each of four weeks. Correlations among scores for each of the four weeks ranged from .51 to .71 (see Table 7). As the purpose was to report on the “amount” of multitasking while working on their research proposals, the four multitasking scores (an average multitasking score each week) were averaged to create an overall multitasking score.

**Time management.** Time management behavior was assessed using a modified version of Macan, Shahani, Dipboye, and Phillips’s (1990) Time Management Behavior

Scale (TMBS). Two of the four factors were utilized here: setting goals and priorities, and mechanics (including planning and scheduling). Ratings were made on a 5-point Likert-type scale ranging from 1 (seldom true) to 5 (often true). Items that did not pertain to this sample and situation were excluded. In reviewing the items, two specifically seemed irrelevant to this sample and context. A second reviewer identified the same two items as potentially problematic. As such, the following items were excluded from the mechanics factor (i.e., “When I found that I was frequently contacting someone, I recorded that person's name, address, and phone number in a special file” and “I use an in-basket and out-basket for organizing paperwork”). This measure was completed only once at the completion of the time use diaries.

**Pacing.** Pacing was measured using a modified version of Gevers, Claessens, Van Eerde, and Rutte’s (2009) pacing style scale II. This scale includes four categories of pacing types, early action, steady, curvilinear (u-shaped), and deadline action. The original scale included a fifth type, but correspondence with the first author suggested using only the four types above (Gevers, personal communication). Participants indicated which one of the four categories reflected how they used their time to complete their research methods proposal.

### **Performance Outcome**

**Task Performance.** The primary measure of task performance was the final grade on the project. After receiving students’ permission for disclosure, lab instructors provided a final grade on their research proposals at the conclusion of the semester. Self-reported performance was also gathered (prior to learning their actual grades) as part of

the final survey from a grade of A to F. Both measures of performance were examined separately.

**Control Variables.** Several variables were controlled for in the analyses below. First, as mentioned above, the contribution of time-related individual difference variables beyond personality is of interest here. As such, personality is controlled for in hypotheses examining the time-related individual difference variables. Furthermore, because students were enrolled in courses with different instructors, course instructor was controlled for in hypotheses investigating performance. Finally, given the academic nature of the task, overall GPA was controlled for.

### **Procedure**

Students' time use was tracked as they completed their final research proposal for their psychology of research methods course. Students were required to write an APA style proposal written in future tense with five references. In addition, the proposal needed to be plausible. Detailed guidelines for the proposal can be found in Appendix A. The proposals were graded when the final product was turned in at the end of the course. Grades ranged from 0 (i.e., did not turn in a paper) to 100.

Data collection took place between February 28<sup>th</sup> and May 4<sup>th</sup>, with a few remaining surveys submitted until May 8<sup>th</sup>. Participants were informed that they would be tracking their progress on their final research proposals for their research methods course by completing short surveys each week in class. The initial battery of surveys included the measures of time perspective, polychronicity time urgency, autonomy, time management, personality, and demographics (majority completed between February 28<sup>th</sup>

and March 18<sup>th</sup> immediately following the class lecture). Students were given a \$5 Starbucks® gift card for their time.

Four weeks prior to the project deadline, the “diary” surveys began (approximately April 4<sup>th</sup>-12<sup>th</sup>, 2010). Students were asked once per week during their class laboratory sessions to complete a survey about their progress on their research proposals. The same survey was administered once each week for the four weeks leading up to the proposal deadline. Finally, on the day students turned in their projects, students completed a third set of measures including their time management for their research proposals, time scarcity and autonomy, how they paced their time to complete the project, as well as the grade they expected to receive (self-reported grade/performance). They were thanked for their participation and time, as well as given a second gift card for \$5. An email with a follow-up survey contained the time-related individual difference measures to be used to compute test-retest reliability for each scale. The range of days between the first and second administrations was 40-67 ( $M = 57.49$ ,  $SD = 7.88$ ). See Table 3 for a summary of the timeline and surveys included in each part. Surveys were entered in SPSS, and then double-checked.

## **Results**

### **Preliminary Analyses**

Prior to running analyses, two checks were done to ensure understanding of the task and to investigate whether or not tracking their time use influenced students' choices of time use. The first check was done to ensure understanding of the time diary survey. Students were asked to record each week how much progress they had made toward the completion of their final research proposal. Marking "0" meant that they had not started their research proposal, written down ideas, etc., whereas "100" meant that the entire project was finished and turned in. They were to mark a line from 0 to 100. Thus, students should record forward (or lack of) progress from week to week. It appears one participant did not understand these directions. The project was reported complete or nearly complete from the day it was assigned. It is possible this student interpreted the directions to mean progress for a given week. These data were retained, as analyses run with and without this case did not show a different pattern of results.

Second, students were explicitly asked at the completion of the study whether they felt that they would have used their time differently had they not participated in this project. Eight students indicated that it had changed how they would have used their time to complete their projects (see Table 8 for descriptions). However, when asked to explain what they would have changed, only four indicated an answer that suggested that they

typically structured their time differently (e.g., Usually, I wait until the last minute to complete projects. This time I started immediately...”). Analyses were run with and without these five questionable cases (i.e., the student who misunderstood the progress question as well as the four who stated they would have used their time differently. The pattern of results was generally the same with and without these cases, and as such, their data were retained<sup>8</sup>.

### **Psychometric Properties of Measures and Preliminary Analyses**

Table 9 provides information on the psychometric properties of the scales used in this study. A check of these properties, including reliabilities and factor structure (specifying the number of factors to extract), was done prior to hypothesis testing<sup>9</sup>. Table 10 summarizes original findings and modifications made where necessary. A full description of these preliminary analyses can be found in Appendix B. Factor analytic loadings for these scales can be found in Tables 11 through 15.

Table 16 contains descriptive information for each of the study composite variables. Table 5 displays correlations among all of the study variables with reliabilities on the diagonal. To mention a few relationships of note, present time perspective was positively correlated with one of the polychronicity measures ( $r = .24$ ) and, interestingly, also positively correlated with self-rated performance ( $r = .29$ ). Future time perspective was negatively correlated with competition ( $r = -.40$ ) and general hurry ( $r = -.44$ ), but

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<sup>8</sup> The exception included the result of H6 in which the p-value increased slightly for the MPI ( $p = .065$ ).

<sup>9</sup> Exploratory Factor Analyses were conducted specifying the number of factors to be extracted considering the sample size.

also negatively associated with conscientiousness ( $r = -.45$ ) and time management ( $r = -.26$ ). The polychronicity measures were both related to multitasking (MPI = .26, PVI = .30). The competitiveness dimension of time urgency was positively related to all of the personality factors, as well as time management ( $r = .42$ ) and negatively related to self-rated performance ( $r = -.27$ ). Interestingly, the general hurry dimension of time urgency was positively related to time management ( $r = .29$ ) and positively related to instructor-rated performance ( $r = .23$ ).

### **Hypothesis Testing**

A summary of hypothesis testing outcomes is provided in Table 2.

*H1: Present time-perspective is negatively related to time management behaviors.*

A hierarchical regression was conducted to examine Hypothesis 1, first entering the five personality traits and overall GPA as control variables. In the second step, time management was regressed onto present time perspective to investigate whether present time perspective was negatively related to engaging in time management behaviors<sup>10</sup>.

Results indicated that, while the relationship trended in the expected direction, it did not reach statistical significance ( $\beta = -.20, p = .10$ ). Thus, support was not found for H1 (see Table 17).

*H2: Future time-perspective is positively related to time management behaviors.*

A hierarchical regression was conducted to examine Hypothesis 2, first entering personality and overall GPA as control variables. In the second step, time management

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<sup>10</sup> Note that time management is examined as a single dimension.

was regressed onto future time perspective to investigate whether future time perspective was positively related to engaging in time management behaviors. Results indicated that, future time perspective predicted time management behaviors ( $\beta = .49, p = .00$ ). Thus, support was found for H2 (see Table 18).

*H3: Polychronicity is positively related to time management behaviors.*

A hierarchical regression was conducted to examine Hypothesis 3, first entering personality, overall GPA, and attentional control (included to account for differences in whether people preferred to multitask or had limited attention) as control variables. In the second step, time management was regressed onto the PVI to investigate whether polychronicity was positively related to engaging in time management behaviors. Results indicated that polychronicity did not predict time management behaviors ( $\beta = .01, p = .92$ ). The same analysis was done with the second measure of polychronicity: the MPI. Again, results indicated that polychronicity did not predict time management behaviors ( $\beta = -.04, p = .69$ ). Thus, support was not found for H3. See Tables 19 and 20.

*H4: Time urgency is positively related to time management behaviors.*

A hierarchical regression was conducted to examine Hypothesis 4, first entering the personality control variables. In the second step, time management was regressed onto time urgency to investigate whether it was positively related to engaging in time management behaviors. Results of the overall model suggest that time urgency did not significantly predict time management behaviors ( $p = .34$ ). Support was not found for H4. However, results for the dimensions of competitiveness and general hurry did trend in the expected direction (competitiveness:  $\beta = .18, p = .26$ , task-related hurry:  $\beta = .00, p$



= .97, general hurry:  $\beta = .15, p = .22$ ). See Table 21. Of note is that the bivariate correlations between the competitiveness and general hurry dimensions and time management were significant prior to controlling for personality ( $r = .42, p = .01$  and  $r = .29, p = .01$ , respectively).

The next set of hypotheses addressed the relationships between the time-related individual differences and pacing.

*H5a: Time perspective is related to pacing such that present time perspective is positively associated with the deadline action pacing.*

A multinomial logistic regression was conducted to assess prediction of pacing behavior. The marginal percentage displays the proportion of valid observations for the different pacing behaviors: 43.5% for curvilinear, 30.6% for deadline action pacing, 16.5% for steady pacing, and 9.4% for early action pacing. As the above hypothesis was most concerned with deadline action pacing, it was selected as the referent to which all other types of pacing were compared. I expected the probability of selecting the other categories would be less than that of deadline pacing as present time perspective increased.

The tested model included the personality variables, overall GPA, and present time perspective. A comparison between the constant only and full model chi-square was significant ( $21, N = 85$ ) = 43.04,  $p < .01$ , suggesting that there was a relationship between pacing and the combination of independent variables. Moreover, the Pearson chi-square (Goodness-of-Fit test) was non-significant  $\chi^2 = 230.57, p > .05$ , indicating good fit. The variance in pacing behaviors accounted for was .43 using Nagelkerke's  $R^2$ , and results

indicated that 52.9% of the participants were correctly classified.

Next, individual parameters were examined. Likelihood ratio tests were used to determine if each of the individual predictors was significantly related to pacing behavior. Present time perspective did not significantly distinguish between deadline action pacing and any of the other pacing behaviors  $(3, 85) = 1.37, p = .71$ . As such, support was not found for H5a. See Table 22 for regression coefficients, Wald statistics, odds ratios, and the 95% confidence intervals for odds ratios for each of the predictors.

*H5b: Time perspective is related to pacing such that future time perspective is positively associated with both early action and steady pacing.*

Again, a multinomial logistic regression was conducted to assess prediction of pacing behavior. Two tests were done, one exploring early action pacing and the second steady pacing as referent groups. Early action pacing was set as the referent group first. I expected that the probability of selecting the other categories would be less than that of early action pacing as the dimensions of time perspective increased.

A comparison between the constant only and full model chi-square was significant  $(21, N = 85) = 46.80, p < .01$ , suggesting that there was a relationship between pacing and the combination of independent variables. The Pearson chi-square (Goodness-of-Fit test) was non-significant  $\chi^2 = 187.30, p > .05$ , demonstrating good fit. The variance in pacing behaviors accounted for was .46 using Nagelkerke's  $R^2$ , and 54.1% of the participants were correctly classified.

Individual parameters were examined next. Likelihood ratio tests indicated that future time perspective did not significantly distinguish between deadline action pacing

and any of the other pacing behaviors ( $3, 85$ ) = 5.13,  $p = .16$ . The analysis was also run using steady pacing as the referent group. The pattern of parameter estimates again did not significantly distinguish between deadline action pacing behavior and any of the other pacing behaviors. Thus, support was not found for H5b. Interestingly, a one-unit increase in future time perspective *decreased* the odds of being in the steady group compared to the early action category ( $p = .07$ ) by 49%. See Tables 23 and 24 for regression coefficients, Wald statistics, odds ratios, and the 95% confidence intervals for odds ratios for each of the predictors.

*H6: Time urgency is positively related to the early action pacing.*

A multinomial logistic regression was conducted to assess prediction of pacing behavior. Early action was selected as the referent to which all other types of pacing were compared. The tested model included the personality variables, overall GPA, and present time perspective. The comparison between the constant only and full model chi-square was significant ( $27, N = 85$ ) = 60.20,  $p < .01$ , suggesting that there was a relationship between pacing and the combination of independent variables. In addition, the Pearson chi-square (Goodness-of-Fit test) was non-significant ( $\chi^2 = 254.13, p > .05$ ), indicating good fit. The variance in pacing behaviors accounted for was .55 using Nagelkerke's  $R^2$ . Results indicated that 64.7% of the participants were correctly classified.

Individual parameter estimates revealed that the dimensions of time urgency did significantly distinguish among some of pacing behaviors: task-related hurry ( $3, 85$ ) = 8.26,  $p = .04$ , and general hurry ( $3, 85$ ) = 10.63,  $p = .01$ . However, differences were not in the expected direction (e.g., more likely to select steady, as opposed to early pacing

behaviors with a one-unit increase in time urgency dimension). Thus, support was not found for H6. See Table 25 for regression coefficients, Wald statistics, odds ratios, and the 95% confidence intervals for odds ratios for each of the predictors.

*H7: Polychronicity is positively related to multitasking.*

A hierarchical regression was conducted to examine Hypothesis 7, first entering the personality, overall GPA, and attentional control as control variables. In the second step, multitasking behavior was regressed onto the PVI to investigate whether polychronicity was positively related to engaging in multitasking behaviors. Results indicated that polychronicity significantly predicted multitasking behaviors ( $\beta = .27, p = .02$ ). A similar result was obtained using the MPI. Again, results indicated that polychronicity significantly predicted multitasking behaviors ( $\beta = .24, p = .04$ ). Thus, support was found for H7. See Tables 26 and 27 for both measures.

*H8: Time urgency is positively related to multitasking.*

A hierarchical regression was conducted to examine Hypothesis 8, first entering the personality and overall GPA as control variables. In the second step, multitasking was regressed onto time urgency to investigate whether time urgency was positively related to engaging in multitasking behaviors. Results of the overall model suggested that time urgency did not significantly predict time management behaviors ( $p = .38$ ). Beta weights for the dimensions were as follows: competitiveness ( $\beta = .04, p = .82$ ), task-related hurry ( $\beta = .08, p = .53$ ), and general hurry ( $\beta = -.24, p = .09$ ). See Table 28. Thus, support was not found for H8.

*H9: Time scarcity is positively related to time management behaviors.*

A hierarchical regression was conducted to examine Hypothesis 9, first entering the personality and overall GPA as control variables. In the second step, time management was regressed onto time scarcity to investigate whether time scarcity was positively related to engaging in time management behaviors. Results indicated that future time perspective did not significantly predict time management behaviors ( $\beta = -.01, p = .91$ ). Thus, support was not found for H9. See Table 29.

*H10: Time scarcity is positively related to multitasking.*

A hierarchical regression was conducted to examine Hypothesis 10, first entering the personality, attentional control, and overall GPA as control variables. In the second step, multitasking was regressed onto time scarcity to investigate whether time scarcity was positively related to engaging in multitasking behaviors. Results indicated that time scarcity significantly predicted multitasking behaviors ( $\beta = .25, p = .04$ ; see Table 30). Thus, support was found for H10.

*H11a: The relationships between the present and future time-perspectives and time management become stronger as autonomy increases.*

Moderated regressions were conducted to examine Hypothesis 11a. Beginning with the present time perspective-time management relationship, personality and overall GPA were entered as control variables. In the second step, main effects for present time perspective and autonomy were entered. In the third step, the product term of present time perspective and autonomy were entered. Results suggested that autonomy did not moderate the relationship between present time perspective and time management ( $\beta = .12, p = .29$ ). A similar pattern of results was obtained when exploring whether autonomy

moderated the relationship between future time perspective and time management ( $\beta = -.04, p = .69$ ). Support was not found for H11a. See Tables 31 and 32.

*H11b: The relationships between the present and future time-perspectives and pacing become stronger as autonomy increases.*

A multinomial regression was conducted to examine the present time perspective-autonomy interaction on pacing. Deadline action pacing was selected as the referent to which all other pacing behaviors were compared. The full model contained the personality variables, GPA, and time urgency dimensions. A comparison between the constant only and full model chi-square was significant ( $24, N = 85$ ) = 46.09,  $p < .01$ . Moreover, the Pearson chi-square test was non-significant ( $\chi^2 = 214.36, p > .05$ ), indicating good model fit. The variance in pacing behaviors accounted for was .46 using Nagelkerke's  $R^2$ , and results indicated that 57.1% of the participants were correctly classified. Likelihood ratio tests indicated that the interaction term (autonomy and present time perspective) did not significantly distinguish between deadline action pacing and other pacing behaviors ( $\chi^2 = 3.85, p = .28$ ).

A multinomial regression was also done for the future time perspective-autonomy interaction using early action as the referent group first. A comparison between the constant only and full model chi-square was significant ( $24, N = 85$ ) = 50.40,  $p < .01$ , suggesting that there was a relationship between pacing and the combination of independent variables, and the Pearson chi-square test was non-significant ( $\chi^2 = 178.39, p > .05$ ), indicating good model fit. The variance in pacing behaviors accounted for was .49 using Nagelkerke's  $R^2$ , and 56% of the participants were correctly classified. Likelihood

ratio tests indicated that the interaction term (autonomy and present future perspective) significantly distinguished between early action pacing and curvilinear pacing such that a one-unit increase in future time perspective-autonomy interaction term increased the odds of being in the early action group ( $p = .05$ ) by 44%. A similar pattern of results was obtained with steady action set as the referent group. See Tables 33 to 35 for regression coefficients, Wald statistics, odds ratios, and the 95% confidence intervals for odds ratios for each of the predictors. Thus, partial support was found for H11b.

*H11c: The relationship between polychronicity and time management becomes stronger as autonomy increases.*

A moderated regression was conducted to examine Hypothesis 11c. Beginning with the polychronicity-time management relationship, personality, attentional control, and overall GPA were entered as control variables. In the second step, main effects for polychronicity (PVI) and autonomy were entered. In the third step, the product term of polychronicity and autonomy were entered. Results suggested that autonomy did not moderate the relationship between polychronicity and time management at the .05 level ( $\beta = .21, p = .06$ ). A similar finding was obtained for the MPI ( $\beta = .20, p = .07$ ). Thus, support was not found for H11c. See Tables 36 and 37. Given the marginally significant results for both measures of polychronicity, the influence of autonomy on the polychronicity-time management relationship is examined further here (see Figure 2). Results suggest the relationship between polychronicity and time management is stronger with higher levels of autonomy, such that those with more autonomy engage in more time management behaviors as level of polychronicity increases.

*H11d: The relationship between polychronicity and multitasking becomes stronger as autonomy increases.*

Hypothesis 11d examined the polychronicity-multitasking relationship, anticipating that the relationship between these two variables becomes stronger as autonomy increases. The PVI was explored first. First, personality, attentional control, and overall GPA were entered as control variables. In the second step, main effects for polychronicity and autonomy were entered. In the third step, the product term of polychronicity and autonomy was entered. Results suggested that autonomy did not moderate the relationship between polychronicity and multitasking ( $\beta = -.10, p = .36$ ). A similar pattern of results was obtained for the MPI ( $\beta = .00, p = .99$ ). Thus, support was not found for H11d (see Tables 38 and 39).

*H11e: The relationship between time urgency and time management becomes stronger as autonomy increases.*

A moderated regression was used to examine the time urgency-time management relationship, anticipating that the relationship between these two variables becomes stronger as autonomy increases. Personality, attentional control, and overall GPA were entered as control variables. In the second step, main effects for time urgency and autonomy were entered. In the third step, the product term of time urgency and autonomy was entered. Results suggested that autonomy did not moderate the relationship between time urgency dimensions and time management direction (competitiveness:  $\beta = .06, p = .62$ , task-related hurry:  $\beta = -.11, p = .39$ , general hurry:  $\beta = .01, p = .93$ ). In sum, support was not found for H11e. See Table 40.



*H11f: The relationship between time urgency and pacing becomes stronger as autonomy increases.*

A multinomial regression was conducted to examine the influence of autonomy on the time urgency-pacing relationship. Early action pacing behavior was selected as the referent to which all other pacing behaviors were compared. The full model contained the personality variables and time urgency dimensions. Overall GPA was omitted here because of unacceptable standard errors. A comparison between the constant only and full model chi-square was significant ( $33, N = 85) = 62.72, p < .01$ , suggesting that there was a relationship between pacing and the combination of independent variables. However, the Pearson chi-square test was significant ( $\chi^2 = 364.41, p < .05$ ), indicating poor model fit. The variance in pacing behaviors accounted for was .56 using Nagelkerke's  $R^2$ , and 62.8% of the participants were correctly classified.

The time urgency dimensions-time scarcity interaction terms did not significantly distinguish among pacing behaviors: competitiveness ( $\chi^2 = 3.54, p = .32$ ), task-related hurry ( $\chi^2 = 0.68, p = .88$ ), and general hurry ( $\chi^2 = 3.73, p = .29$ ). As such, support was not found for H11f. See Table 41 for regression coefficients, Wald statistics, odds ratios, and the 95% confidence intervals for odds ratios for each of the predictors.

*H11g: The relationship between time urgency and multitasking becomes stronger as autonomy increases.*

Finally, a moderated regression was used to examine the interaction between time urgency and autonomy on multitasking. Personality, attentional control, and overall GPA were entered as control variables. In the second step, main effects for time urgency and

autonomy were entered. In the third step, the product term of time urgency and autonomy was entered. Results suggested that autonomy did not moderate the relationship between time urgency dimensions and multitasking (competitiveness:  $\beta = -.17, p = .17$ , task-related hurry:  $\beta = .10, p = .46$ , general hurry:  $\beta = -.16, p = .18$ ). See Table 42. Support was not found for H11g.

*H12a: The relationships between present and future time-perspectives and time management become weaker as time scarcity increases.*

Moderated regressions were conducted to examine Hypothesis 12a. Beginning with the present time perspective-time management relationship, personality and overall GPA were entered as control variables. In the second step, main effects for present time perspective and time scarcity were entered. In the third step, the product term of present time perspective and time scarcity was entered. Results suggested time scarcity did not moderate the relationship between present time perspective and time management ( $\beta = .02, p = .84$ ).

The second half of H12a examined the influence of time scarcity on the future time perspective-time management relationship. Personality and overall GPA were entered as control variables. In the second step, main effects for future time perspective and time scarcity were entered. In the third step, the product term of future time perspective and time scarcity was entered. Results indicated that time scarcity did not moderate the relationship between future time perspective and time management ( $\beta = -.11, p = .25$ ). In sum, support was not found for H12a (see Tables 43 to 44).

*H12b: The relationship between polychronicity and time management becomes stronger*

*as time scarcity increases.*

Moderated regressions were conducted to examine Hypothesis 12b. Beginning with the PVI, personality, attentional control, and overall GPA were entered as control variables. In the second step, main effects for polychronicity and time scarcity were entered. In the third step, the product term of polychronicity and time scarcity was entered. Results suggested time scarcity did not moderate the relationship between polychronicity and time management ( $\beta = -.14, p = .18$ ). See Table 45. Similarly, results for the MPI suggested time scarcity did not moderate the relationship between polychronicity and time management ( $\beta = -.14, p = .21$ ). Support was not found for H12b (see Table 46). Of note is that the bivariate correlations between the MPI and time management were significant prior to controlling for personality, attentional control, and overall GPA ( $r = .22, p = .05$ ).

*H12c: The relationship between polychronicity and multitasking becomes stronger as time scarcity increases.*

Moderated regressions were conducted to examine Hypothesis 12c. Beginning with the PVI, personality, attentional control, and overall GPA were entered as control variables. In the second step, main effects for polychronicity and time scarcity were entered. In the third step, the product term of polychronicity and time scarcity was entered. Results suggested time scarcity did not moderate the relationship between polychronicity and multitasking ( $\beta = -.02, p = .85$ ). The same analysis was done with the MPI. Again, time scarcity did not moderate the relationship between polychronicity and multitasking ( $\beta = .00, p = .99$ ). Support was not found for H12c (see Tables 47 and 48).

*H12d: The relationship between time urgency and time management becomes stronger as time scarcity increases.*

A moderated regression was used to examine Hypothesis 12d. Personality and overall GPA were entered as control variables. In the second step, main effects for time urgency and time scarcity were entered. In the third step, the product term of time urgency and time scarcity was entered. Results suggested that time scarcity did not moderate the relationship between time urgency dimensions and time management (competitiveness:  $\beta = -.22, p = .05$ , task-related hurry:  $\beta = .13, p = .25$ , general hurry:  $\beta = -.11, p = .36$ ). See Table 49. Thus, no support was found for H12d.

*H12e: The relationship between time urgency and pacing becomes stronger as time scarcity increases.*

A multinomial regression was conducted to examine Hypothesis 12e. Early action pacing was selected as the referent to which all other pacing behaviors were compared. The tested model included the personality variables, overall GPA, and present time perspective. A comparison between the constant only and full model chi-square was significant ( $27, N = 85$ ) = 71.32,  $p < .01$ , suggesting that there was a relationship between pacing and the combination of independent variables. However, the Pearson chi-square test was significant ( $\chi^2 = 395.89, p < .05$ ), indicating poor model fit. The variance in pacing behaviors accounted for was .62 using Nagelkerke's  $R^2$ , and results indicated that 62.4% of the participants were correctly classified.

Next, individual parameters were examined. The time urgency general hurry-time scarcity interaction term did trend in the expected direction, distinguishing among some

spacing behaviors ( $\chi^2 = 7.61, p = .06$ ). Specifically, a one-unit increase in this predictor decreased the odds of choosing deadline action spacing by 30%. Stated another way, as perceptions of time scarcity increased, those higher on the general hurry dimension are 30% more likely to choose early action, as opposed to deadline action spacing ( $p = .05$ ). Thus, partial support was found for H12e. See Table 50.

*H12f: The relationship between time urgency and multitasking becomes negative as time scarcity increases.*

A moderated regression was used to examine Hypothesis 12f. Personality, attentional control, and overall GPA were entered as control variables. In the second step, main effects for time urgency and time scarcity were entered. In the third step, the product term of time urgency and time scarcity was entered. Results indicated that time scarcity did not moderate the relationship between the time urgency dimensions and multitasking behaviors (competitiveness:  $\beta = .04, p = .76$ , task-related hurry:  $\beta = .13, p = .32$ , general hurry:  $\beta = -.10, p = .44$ ). See Table 51. Support was not found for H12d.

*H13: Time management behaviors are positively related to performance.*

A hierarchical regression was performed to examine Hypothesis 13, first controlling for lab instructor and overall GPA<sup>11</sup>. In the second step, instructor-rated performance was regressed onto time management to investigate whether time management was positively related to instructor-rated performance. Results indicated that

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<sup>11</sup> Note that five students received a grade 0 out of 100. Analyses were run with and without these cases, and the pattern of results was the same. For consistency, these cases were retained in the results presented above.

time management did not significantly predict instructor-rated performance ( $\beta = .02, p = .88$ ). Similarly, results of a second hierarchical regression indicated that time management did not significantly predict self-rated performance ( $\beta = -.09, p = .42$ ). Thus, support was not found for H13 (see Tables 52 and 53).

*H14: Pacing is related to task performance such that early action, steady and curvilinear pacing are associated with the highest task performance.*

Because pacing is a categorical variable, effects coding was used. Three new variables were created for this purpose. Following this step, a hierarchical regression was conducted to explore Hypothesis 14, first controlling for lab instructor and overall GPA. In the second step, instructor-rated performance was regressed onto pacing to investigate whether pacing was related to instructor-rated performance. Results indicated that pacing did not significantly predict instructor-rated performance ( $p = .90$ ). Betas for pacing were as follows: steady pacing ( $\beta = -.01, p = .92$ ), curvilinear pacing ( $\beta = -.01, p = .91$ ), and deadline action pacing ( $\beta = .07, p = .46$ ). Similarly, results of a second hierarchical regression indicated that pacing did not significantly predict self-rated performance ( $p = .23$ ). Betas for pacing were as follows: steady pacing ( $\beta = -.19, p = .09$ ), curvilinear pacing ( $\beta = .03, p = .79$ ), and deadline action pacing ( $\beta = .18, p = .10$ ). Thus, support was not found for H14 (see Tables 54 and 55).

*H15: Multitasking is negatively related to task performance.*

A hierarchical regression was performed to examine Hypothesis 15, first controlling for lab instructor, attentional control, and overall GPA. In the second step, instructor-rated performance was regressed onto multitasking to investigate whether

multitasking was negatively related to instructor-rated performance. Results indicated that multitasking did not predict instructor-rated performance ( $\beta = -.12, p = .24$ ).

Similarly, results of a second hierarchical regression indicated that multitasking did not significantly predict self-rated performance ( $\beta = .07, p = .54$ ). Thus, support was not found for H15 (see Tables 56 and 57).

## Discussion

The aim of this dissertation was to shed light on the relationship between time-related individual differences and actual time use and on how time use is related to performance. A summary of study hypotheses and outcomes of statistical tests can be found in Table 2. Some support was found with regard to the set of associations between time-related individual differences and time use dimensions (see H<sub>1</sub>-H<sub>10</sub> in Figure 1). Future time perspective was positively related to time management (H2). Stated another way, as expected, someone with a high standing on this dimension of time perspective is likely to engage in more time management behaviors than someone low in this dimension. However, contrary to prediction, hypotheses linking polychronicity and time urgency to time management were not supported. The predicted direct relationships with pacing were not supported. The third time-related individual difference of interest was multitasking. Here, polychronicity and time scarcity were found to positively relate to multitasking behaviors (H7 and H10). Thus, the greater a person's preference for doing multiple tasks at the same time, the more likely he or she is to actually work on tasks simultaneously. Similarly, the greater a person's sense of time scarcity, the more likely he or she does multiple tasks at the same time. Time urgency was not found to relate to multitasking.

The second piece of the model explored two moderators of the time-related



individual difference-time use dimension relationships (see H<sub>11</sub>-H<sub>12</sub> in Figure 1). Some support was found suggesting autonomy is an important moderator (H<sub>11a</sub>-H<sub>11g</sub>). First, the relationship between future time orientation and pacing differs with increasing levels of autonomy such that a one-unit increase in the interaction term makes it 44% more likely that someone will select early action pacing over a curvilinear behavior (H<sub>11b</sub>). Second, the relationship between polychronicity and time management also changed with increasing levels of autonomy. Results suggest the relationship between polychronicity and time management is stronger with higher levels of autonomy, such that those with higher polychronicity engage in more time management behaviors as level of autonomy increases (H<sub>11c</sub>). Time scarcity was also expected to moderate the relationships between time-related individual differences and time use dimensions (H<sub>12a</sub>-H<sub>12f</sub>). Again some support was found for this link. Specifically, the relationship between time urgency and pacing changed with time scarcity for the general hurry dimension. A one-unit increase in this predictor decreased the odds of choosing deadline action pacing by 30%. Stated another way, as perceptions of time scarcity increased, those higher on the general hurry dimension were 30% more likely to choose early action as opposed to deadline action pacing.

Finally, the third section of the model examined the links between time use dimensions and performance – both self-perceptions and more objective instructor-rated performance (See H<sub>13</sub>-H<sub>15</sub> in Figure 1). Interestingly, results of this study suggest that there may not be a correct answer when it comes to effectively using time to accomplish a goal, as none of the time use dimensions was significantly related to performance.

Implications for these findings are discussed in more detail below.

### **Pattern of Results**

The pattern of results supports an interactionist framework. Both person and situational variables influenced time use in this study. First, broad conceptualization of time, specifically future time perspective, was shown to relate to time management behaviors. In addition, future time perspective also related to pacing with increased perceptions of autonomy such that it was more likely that someone high on future perspective would choose early action pacing over a curvilinear pace when completing project work. Present time perspective did not relate to time use behaviors here. These findings are consistent with Murrell and Mingrone's (1994) finding that students high on future time perspective focused on success through goal-directed behaviors. Time management and pacing may both be considered goal-directed activities. Interestingly, present time perspective was not related to time use behaviors as expected. However, it might be the case that present time perspective is not related to the opposite end of the time use continuum (e.g., negatively related to time management), as expected. Here, present time perspective was simply not related to time use dimensions.

Polychronicity was the second time-related individual difference described here, and it, too, was related to time use behaviors. Rather than a temporal focus like time perspective, polychronicity is a preference for using time. Its relationship with time management was stronger with increasing levels of autonomy. Polychronicity was also positively related to multitasking. Thus, someone high on polychronicity can be expected to multitask, and when the perception of autonomy in scheduling work is high, this

person could also be expected to engage in time management behaviors.

The final time-related individual difference studied here was time urgency. Surprisingly, time urgency, overall, was not found to relate to time use behaviors. The exception to these null findings was pacing. Here, time scarcity moderated the relationship between time urgency and pacing such that with greater time urgency, a time urgent individual was more likely to engage in an early action, as opposed to a deadline action pace.

### **Implications for Time Use**

Results of this study lend some support to the notion that time-related individual differences relate to time use dimensions. König et al. (2010) recently found support for the link between polychronicity (trait) and multitasking (behavior) using a sample of Swiss health industry workers. To my knowledge, the current study is among the first investigations to distinguish between the polychronicity and multitasking in a real-time context as opposed to a lab setting. The finding the future time perspective is positively related time management is in line with the Díaz-Morales et al. (2008) finding that future time perspective is associated with less procrastination – indicative of more planning behaviors. While findings were somewhat mixed concerning the predicted relationships among the time-related individual differences and time use dimensions, the fact that some of them were supported suggests that future study of how we think about and prefer to use time to accomplish work is necessary.

### **Implications for Performance Outcomes**

Perhaps of more interest to both employees and employers (in addition to students

and teachers), is how time use relates to performance. An attempt was made to study a group of people working on project taking place over a number of weeks, at the end of which the final product was evaluated, much like the typical tasks of white collar employees today. At least in this setting, time use did not relate to performance. While results of this study do not support a link between time use and performance, other existing research does support such associations (e.g., time management and student GPA, Britton & Tesser, 1991; planning behavior and job performance, Claessens et al., 2004; pacing and performance, Labianca et al., 2005).

**Time Management.** Findings from this study indicate that time management is not related to performance. While I argued the opposite, findings in the literature are mixed. For example, Macan (1994) found that performance was unrelated to time management (through perceived control over time). Prior studies, as well as the formal hypotheses tested here, typically speak only to the quantity of time management behaviors, as opposed to the combination of quantity and *quality* of the prioritizing, planning and scheduling. It seems quite plausible that the combination of quantity and quality of planning behaviors are related to performance. In fact, exploratory analyses (see Appendix C) reveal a positive correlation between averaged retrospective assessment of amount of progress made each week and instructor-rated performance ( $r = .23, p < .05$ ). Moreover, closer examination of weekly responses revealed that estimates of the final week's work (leading up to the deadline) specifically were significantly correlated with instructor-rated performance, whereas earlier weeks' estimates were not significantly related to final grades. Response options were offered on a continuum

ranging from 1 (not as much progress as I expected) to 5 (much more progress than I expected). This result, although correlational, implies that there may be a relationship between accurately or overestimating the amount of time necessary to complete work and performance (i.e., not running out of time to complete a task).

**Pacing.** Pacing was not found to relate to performance. While contrary to Gersick's (1989) consistent finding that (teams) who more successfully paced and transitioned to creating the final product of their work in fact performed better than those teams who less successfully paced their time, there are potential explanations for this null finding. First, pacing is conceptualized in the literature as both a trait/type (Gevers et al., 2008) as well as a behavior (e.g., Levine, 1988; Okhuysen & Waller, 2002). There appears to be equal support for both. It is quite possible that students had established a strong habit or pattern of pacing their work by their last year (on average) of college, and that pacing should have been treated as a trait.

Another possibility is that pacing may be more important for some types of tasks more so than others. While the project studied here was done over the course of approximately a month, the task was relatively straightforward. Moreover, some pacing was provided during the project by instructors who checked/reviewed portions of their progress on specified days/weeks. Thus, if they wanted feedback, some mini-deadlines were already established. Considering the abovementioned factors, perhaps it makes sense that pacing is of less importance to performance in this case. While other research suggests that pacing of work does relate to performance (e.g., Gersick, 1989), the relationship between pacing and performance may be more complex. For example, it

might be the case that pacing behaviors change for different types of tasks (e.g., steady pacing for recurrent, predictable tasks, but early action pacing for new tasks, or that there is an interaction between work rate and the sequencing of tasks). Thus, additional research is needed to enhance our understanding of this relationship.

**Multitasking.** A relationship between multitasking and performance was not found in this study. However, this null finding is contrary to existing evidence that engaging in more than one task simultaneously reduces performance (e.g., driving while using a cell phone, Charlton, 2009). Similar to the pacing variable, perhaps multitasking, for this type of task, is simply not a useful predictor of performance. Given the timeline and requirements of the objective of writing a research proposal, perhaps switching to another task provides mental time to incubate on a creative project such as a research proposal. If this is the case, multitasking may not hamper performance on this type of task. Most of the research on multitasking has been done in a lab setting under conditions in which multiple tasks required mental attention. This is a different situation than a long-term, creative project as was done in this study.

### **Limitations and Future Directions**

As with any study, there are a number of limitations that warrant discussion, as well as multiple interesting avenues for future research. First, while students served as a useful initial sample, there is a possibility that their life circumstances may influence how they choose to use their time in a different way than do people in other phases of life. For example, perhaps people may change their time use behaviors or time management behaviors as they progress up their career ladders (e.g., delegate more, ignore whether

they enjoy a task or not), or as they acquire more job experiences. In addition, the consequences for putting this project low on their list of priorities was met with minimal consequences, as this paper was one of a number of assignments contributing to their final grade in this course. In a similar vein, the dependent variable was somewhat restricted, as nearly all students (90.3%) received A's and B's on their research proposals. Similarly, 94% of students expected A's and B's.

Future research would benefit from a larger, field sample of employees as opposed to students, perhaps working on long-term projects in teams. It would also be quite interesting to explore differences in time use based on the type of work in which employees are involved. For example, a project manager, by nature of the job, is focused on the use of time, timelines, and progress toward goals of multiple people over a long term timeline. We know, at this point, little of how differences in time-related individual differences might relate to how this person uses time to accomplish work (as opposed to a mechanic, for instance, who is frequently completing projects in a much shorter time frame).

Also of import to advancing our understanding of time use in the workplace is the measurement of these constructs. While the majority of constructs demonstrated adequate psychometric properties, some showed unexpected results. For example, the time management measure, when explored using an EFA, revealed only one factor as opposed to the expected two factors. Moreover, a more refined estimate of multitasking would be useful, as only retrospective estimates were possible using the current design. Future study would benefit from using a real "time diary" situation in which people report their

time use behaviors one or more times per day.

### **Conclusion**

The aim of this study was to further our understanding of time use in accomplishing work. Mixed support was found linking time-related individual differences to time use dimensions. Interestingly, while the literature supports a link between time use and performance, little evidence was found here for relationships between the time use dimensions and instructor-rated, or self-perceived, performance on a class paper.



Table 1

*Time-related Individual Differences Identified by Francis-Smythe and Robertson*

Factor	Description
Leisure Time Awareness	Time spent outside paid work relating to a person's awareness of actual time and how it is used
Punctuality	Attitude toward being on time. Punctuality applies to both minutes, as well as days and minutes with respect to deadlines
Planning	Attitude toward planning tasks in advance (i.e., the sequence of tasks through prioritizing and list-making and working during available time)
Polychronicity	Preference for doing more than one thing at a time
Impatience	Tendency to want to complete current task quickly (e.g., try to control speed of interactions with other people)

Table 2

*List of Study Hypotheses and Outcomes*

Hypotheses	Support
H1: Present time-perspective is negatively related to time management behaviors.	Not supported
H2: Future time-perspective is positively related to time management behaviors.	Supported
H3: Polychronicity is positively related to time management behaviors.	Not supported
H4: Time urgency is positively related to time management behaviors.	Not supported
H5a: Time perspective is related to pacing such that present time perspective is positively associated with the deadline action pacing.	Not supported
H5b: Time perspective is related to pacing such that future time perspective is positively associated with both early and steady pacing.	Not supported
H6: Time urgency is positively related to the early action pacing.	Not supported
H7: Polychronicity is positively related to multitasking.	Supported
H8: Time urgency is positively related to multitasking.	Not supported
H9: Time scarcity is positively related to time management behaviors.	Not supported
H10: Time scarcity is positively related to multitasking.	Supported
H11a: The relationships between the present and future time-perspectives and time management become stronger as autonomy increases.	Not supported
H11b: The relationships between the present and future time-perspectives and pacing become stronger as autonomy increases.	Partial support

H11c: The relationship between polychronicity and time management becomes stronger as autonomy increases.	Partial support
H11d: The relationship between polychronicity and multitasking becomes stronger as autonomy increases.	Not supported
H11e: The relationship between time urgency and time management becomes stronger as autonomy increases.	Not supported
H11f: The relationship between time urgency and pacing becomes stronger as autonomy increases.	Not supported
H11g: The relationship between time urgency and multitasking becomes stronger as autonomy increases.	Not supported
H12a: The relationships between present and future time-perspectives and time management become weaker as time scarcity increases.	Not supported
H12b: The relationship between polychronicity and time management becomes stronger as time scarcity increases.	Not supported
H12c. The relationship between polychronicity and multitasking becomes stronger as time scarcity increases.	Not supported
H12d. The relationship between time urgency time management becomes stronger as time scarcity increases.	Not supported
H12e. The relationship between time urgency and pacing becomes stronger as time scarcity increases.	Partial support
H12f. The relationship between time urgency and multitasking becomes negative as time scarcity increases.	Not supported
H13: Time management is positively related to performance.	Not supported
H14: Pacing is related to task performance such that early action, steady and curvilinear pacing are associated with the highest task performance.	Not supported
H15: Multitasking is negatively related to task performance.	Not supported

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Table 3

*Sequence of Survey Administration*

Part	Measures
Part 1	Informed Consent Time-related Individual Differences: Time Perspective, Polychronicity, Time Urgency Personality Autonomy Attention Demographic Items
Part 2	Time Diary Multitasking
Part 3	Time Management Pacing Time Scarcity Performance: Self-rated
Part 4	Performance: Instructor-reported grades Time-related Individual Differences: Time Perspective, Polychronicity, Time Urgency Personality Autonomy

Table 4

*Study Descriptives*

Demographic Variable	<i>M</i>	<i>SD</i>
Age	23.92	6.26
GPA	3.21	0.51
Hours worked	14.31	13.23
Spring Semester Credits Enrolled in	13.95	3.01
	N	%
Ethnicity		
Caucasian	52	55.3%
African American	8	8.5%
Asian/Pacific Islander	12	12.8%
Latino or Hispanic	7	7.4%
Native American	1	1.1%
Other	14	14.9%
Gender		
Men		19.1%
Women		80.9%
College Year		
Second	11	11.7%
Third	30	31.9%
Fourth	43	45.7%
Fifth	9	9.6%
Beyond Fifth	1	1.1%
Marital Status		
Never Married	72	76.6%
Living with Another	7	7.4%
Married	11	11.7%
Separated	1	1.1%
Divorced	3	3.2%
Dependents (included children, parents, relatives)		
None	82	87.2%
One	4	4.3%
Two	3	3.2%
Three	3	3.2%
Four	1	1.1%
Five or more	1	1.1%

*Note.* N = 94.

Table 5  
*Study Variable Correlations and Reliabilities*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. TP – P	(.860)																			
2. TP – F	-.414**	(.754)																		
3. MPI	.240*	-.105	(.942)																	
4. PVI	.134	.018	.865**	(.910)																
5. TU – C	-.071	.531**	.030	.070	(.763)															
6. TU –T-RH	-.057	-.164	-.134	-.122	.083	(.848)														
7. TU – GH	-.369**	.405**	.100	.188	.354**	.002	(.632)													
8. Extra	.172	.281**	.138	.201	.454**	-.156	.192	(.875)												
9. Open	.028	.283**	-.009	.046	.327**	-.142	.119	.152	(.768)											
10. Agree	.324**	.031	.120	.096	.302**	.001	-.110	.307**	.367**	(.791)										
11. Neuro	.039	.214*	.166	.144	.267**	-.338**	.048	.457**	.240*	.421**	(.776)									
12. Consci	-.357**	.547**	-.088	.000	.507**	-.280**	.517**	.261*	.226*	.099	.221*	(.878)								
13. TM	-.191	.557**	.007	.094	.423**	-.080	.294**	.277**	.252*	.236*	.349**	.356**	(.906)							
14. Multi	.027	.037	.267*	.300**	.132	.010	-.109	.211*	-.054	.133	.120	.060	.217*	(.871)						
15. Pacing	-.053	-.045	-.252*	-.284**	-.203	.052	-.192	-.034	-.082	-.152	-.124	-.199	-.192	-.174	N/A					
16. Grade	-.203	.326**	-.202	-.157	.188	.147	.229*	-.044	-.014	-.024	-.019	.280**	.083	-.082	-.041	N/A				
17. Self Perf	.291**	-.239**	.149	.087	-.267*	-.033	-.107	.106	-.177	.104	.040	-.155	-.127	.071	.155	-.537**	N/A			
18. Autonomy	.080	.133	-.053	-.031	.189	-.185	.016	.033	.222*	.204	.132	.232*	.122	-.125	-.104	.308**	-.131	(.769)		
19. Time Scarcity	.062	-.056	.038	-.067	.101	.391**	-.149	.035	.022	.411**	.105	-.132	.003	.253*	.151	-.169	.098	-.181	(.894)	
20. Attention	-.200	.406**	.185	.248*	.430**	-.329**	.469**	.361**	.312**	-.047	.354**	.495**	.253*	.060	-.209	.037	-.109	.138	-.210	(.844)

*Notes.* N's range from 85-94. Coefficient alphas shown on the diagonal. TP-P = Present Time Perspective. TP-F = Future Time Perspective. MPI = Multitasking Preference Inventory. TP = Time Perspective. TU = Time Urgency. TM = Time Management. MPI = Multitasking Preference Inventory. PVI = Polychronic Values Inventory. TU-C = Time Urgency – Competitiveness. TU-T-RH = Time Urgency – Task-related Hurry. TU-GH = Time Urgency – General Hurry. Extra = Extraversion. Open = Openness. Agree = Agreeableness. Neuro = Neuroticism. Consci = Conscientiousness. TM = Time Management. Multi = Multitasking. Self Perf = Self-rated Performance. The multitasking reliability is the average of the five weeks' reliabilities. \*\*p < .05. \*\*\*p < .01.

Table 6

*Reported Reasons for Accomplishing less than Anticipated*

Category	Frequency (Wks 1-4)				Example
Other Coursework	6	11	12	2	“Many different end-of-the semester papers were due on the same week/exams in my other classes”
Personal/Social Commitments or Conflicts	11	12	9	2	“Another family reunion...”, “...offering of career opportunities...”
Require more Project Guidance	2	1	3	0	“Feel as if I needed more feedback and guidance on the ideas/topics/research methods.”
Changed Project Topic	4	0	0	0	“My journal articles I had picked before no longer applied because I changed my topic slightly so I have to go back later this week and find three more to put in my introduction.”
Procrastinated	5	8	4	1	“I procrastinated by doing other things...”
Forgot	0	0	0	1	“I forgot”
Less deadlines	0	0	1	0	“I was less busy, and therefore less productive. I need to keep very busy to be the most productive”
Technical Issues	0	0	0	1	I had accomplished everything that I was expecting to (the entire project), but this morning when I went to print out my revised proposal, my computer froze and my changes were deleted...”



Table 7

*Correlations among Reported Multitasking for by Week*

Week	1	2	3	4
1	1.00			
2	.66	1.00		
3	.51	.70	1.00	
4	.64	.64	.71	1.00

*Note.* N's range from 49 to 82.

Table 8

*Reported Reasons for Changing Time Use Strategies as a Result of Study Participation*

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Reason
“I always forgot about this study until I walked into lab and saw you.”
“I could have been more organized and made a better schedule for myself.”
“I could have used more research and put more effort into it, but since I waited until the last minute, it probably is not as good as it could be.”
“My time delegation.”
“Stop procrastinating and focus.”
“This study made me somewhat more aware of how I’m spending my time, and I made more of an effort not to waste it.”
“Usually I wait until the last minute to complete projects. This time I started immediately, fell off, then completed them.”
“Yes, I would have it printed and ready the night before.”

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*Note.* N = 8.

Table 9

*Example of Psychometric Properties of Study Scales*

Measure	Alpha	Test-retest <i>M</i> = 57.49 days <i>SD</i> = 7.88 days Range = 40-67 days	Source
Time Perspective			Zimbardo & Boyd (1999)
Present-hedonic	.77	.79 (4 wks)	
Present-fatalistic	.72	.74	
Future	.75	.77	
Polychronicity			
MPI	.91	.88 (1 wk)	Poposki & Oswald's (2010)
PVI	.68-.93	.78 (4 wks)	Bluedorn, Kalliath, Strube, & Martin's (1999)
Time Urgency	Students	Clerical workers (4 months)	Landy, Rastergary, Thayer, & Colvin (1991)
Competitiveness	.76, .81	.93	(student and non-student sample)
Task-related Hurry	.71, .75	.95	
General Hurry	.78, .81	.90	
Personality			Saucier (1994)
Extraversion	.83		
Agreeableness	.81		
Conscientiousness	.83		
Emotional Stability	.78		
Intellect/Openness	.78		
Autonomy	.85	.71 (1 month)	Breaugh (1989)
Attentional Control	.88		Rothbart, Ahadi, & Evans (2000)
Time Management			Macan, Shahani, Dipboye, & Phillips (1990)
Setting Goals &	.83		

Priorities	.62		
Mechanics			
Multitasking	.75	No data	König, Oberacher, & Kleinmann (2010)
Pacing			
Time Scarcity	.87		Kaufman-Scarborough & Lindquist (2003)

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Table 10  
*Psychometric Properties and Measure Modifications*

Scale	Original Alpha	Eigenvalues	EFA Variance Accounted for	Revised Alpha	Test-retest Reliability
<b>Time Perspective</b>					
Present	.88 (24)	8.55, 3.33	32.11	.86 (14)	.77
Future	.78 (13)	(6.25, 2.65)	(35.58)	.75 (12)	.65
<b>Polychronicity</b>					
PVI	.91 (10)	5.54	55.38	.91 (10)	.60
MPI	.93 (14)	7.48, 1.23 (7.06)	62.25 (64.15)	.94 (11)	.52
<b>Time Urgency</b>					
	.75 (6)			.75 (6)	.81
Competitiveness	.85 (3)	3.48, 2.69,	56.24	.85 (3)	.68
Task-related	.63 (5)	1.71 (3.45,	(56.24)	.63 (5)	.73
Hurry		2.69, 1.71)			
<b>General Hurry</b>					
<b>Personality</b>					
Extraversion	.88 (8)	7.23, 4.08,	50.82	.88 (8)	.89
Agreeableness	.77 (8)	3.47, 2.82,	(58.26)	.79 (6)	.80
	.86 (8)	2.23 (7.37,		.88 (7)	.87
Conscientiousness	.73 (8)	3.81, 3.27,		.78 (6)	.76
Emotional	.68 (8)	2.23, 1.96)		.77 (5)	.85
<b>Stability</b>					
<b>Intellect/Openness</b>					
Autonomy	.77 (3)	2.07	68.82	.77 (3)	.32
Attentional	.84 (6)	3.39	56.43	.84 (6)	N/A
<b>Control</b>					
<b>Time</b>					
Management	.82 (10)	6.90, 1.55	44.47	.91 (as 1	N/A
Setting Goals	.83 (9)	(6.90)	(40.61)	dimension)	
<b>&amp; Priorities</b>					
<b>Mechanics</b>					
Multitasking	.88 (6)	3.06-3.71	61.20- 74.15	.87 (5)	N/A
Time Scarcity	.89 (6)	3.96	68.82	.89 (6)	N/A

*Note.* Number of items in parentheses. Revised eigenvalues in parentheses. An EFA was

run on each week for the multitasking variable.

Table 11

*Revised Factor Loadings for Time Perspective*

	Factor	
	Present	Future
Taking risks keeps my life from becoming boring	0.715	
It is important to put excitement in my life	0.707	
I take risks to put excitement in my life	0.667	
I often follow my heart more than my head	0.635	
I find myself getting swept up in the excitement of the moment	0.609	
I make decisions on the spur of the moment	0.603	
I do things impulsively	0.534	
It is more important for me to enjoy life's journey than to focus only on the destination	0.520	
I believe that getting together with ones friends to party is one of life's important pleasures	0.515	
I prefer friends who are spontaneous rather than predictable	0.507	

It doesn't make sense to worry about the future, since there is nothing that I can do about it anyway	0.419
Spending what I earn on pleasures today is better than saving for tomorrows security	0.417
Ideally, I would live each day as if it were my last	0.417
Fate determines much in my life	0.359
Meeting tomorrows deadlines and doing other necessary work comes before tonight's play	0.654
When I want to achieve something, I set goals and consider specific means for reaching those goals	0.609
I complete projects on time by making steady progress	0.604
I am able to resist temptations when I know that there is work to be done	0.533
I meet my obligations to friends and authorities on time	0.449
I make lists of things to do	0.415
There will always be time to catch up on my work	0.388
I keep working at difficult, uninteresting tasks if they will help me get ahead	0.379
I believe that a person's day should be planned ahead each morning	0.347
It upsets me to be late for appointments	0.333
If things don't get done on time, I don't worry about it	0.291

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Table 12

*Factor Loadings for Time Urgency*

Item	Factor		
	Competitive	Task-related Hurry	General Hurry
I am ambitious	0.854		
I am hard driving	0.670		
I am hard driving and competitive	0.643		
I go all out	0.506		
I set deadlines or quotas for myself at work and other things	0.356		
I am usually pressed for time		0.937	
I often feel very pressed for time		0.884	
I am often in a hurry		0.645	
I often work slowly and leisurely			0.750
I am slow doing things			0.542
My spouse or a close friend would rate me as definitely relaxed and easy going			0.456

I have a strong need to excel in most things	0.428
I usually work fast	0.424
I like work that is slow and deliberate	0.421

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Table 13

*Revised Factor Loadings for Mini Marker Personality Items*

Item	Neuroticism	Conscientiousness	Extraversion	Agreeableness	Openness
Moody	0.728				
Jealous	0.717				
Envious	0.601				
Temperamental	0.525				
∞   Unenvious	0.414				
Fretful	0.282				
Organized		0.934			
Disorganized		0.906			
Sloppy		0.741			
Inefficient		0.694			
Efficient		0.607			
Careless		0.516			

Systematic	0.507	
Quiet	-0.900	
Extraverted	-0.730	
Talkative	-0.670	
Shy	-0.698	
Bold	-0.619	
Withdrawn	-0.520	
Bashful	-0.501	
Energetic	-0.475	
Kind		0.786
Sympathetic		0.764
Warm		0.732
Harsh		0.469
Cold		0.454
Cooperative		0.304

Uncreative	0.820
Imaginative	0.802
Creative	0.802
Unintellectual	0.284
Intellectual	0.278

---

Table 14

*Factor Loadings for Time Management Scale*

Items	Factor	
	1	2
During the workday, I evaluated how well I was following the schedule I had set down for myself	0.896	
I scheduled activities at least a week in advance	0.731	
I reviewed my daily activities to see where I was wasting time	0.665	
I blocked out time in my daily schedule for regularly scheduled events	0.564	
I set deadlines for myself when I set out to accomplish a task	0.561	
When I decided on what I would try to accomplish in the short term, I kept in mind my long-term objectives	0.554	
I reviewed my goals to determine if they needed revising	0.546	
I set priorities to determine the order in which I would perform tasks each day	0.526	
I broke complex, difficult projects down into smaller manageable tasks	0.523	
If I knew I would have to spend time waiting, I brought along something I could work on	0.475	
I carried a notebook to jot down notes and ideas	0.393	
I looked for ways to increase the efficiency with which I performed my work activities	0.380	
I set short-term goals for what I wanted to accomplish in the coming days or weeks	0.351	
I found places to work that would allow me to avoid interruptions and distractions	0.300	

I made a list of things to do each day and checked off each task as it was accomplished	0.697
I carried an appointment book with me	0.650
I wrote notes to remind myself of what I needed to do	0.615
I finished top priority tasks before going on to less important ones	0.420
I kept a daily log of my activities	0.419

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Table 15

*Revised Factor Loadings for Time Management Scale*

Item	Factor
I made a list of things to do each day and checked off each task as it was accomplished	0.714
During the workday, I evaluated how well I was following the schedule I had set down for myself	0.680
I wrote notes to remind myself of what I needed to do	0.676
I scheduled activities at least a week in advance	0.658
I broke complex, difficult projects down into smaller manageable tasks	0.647
I blocked out time in my daily schedule for regularly scheduled events	0.643
I set priorities to determine the order in which I would perform tasks each day	0.639
I set deadlines for myself when I set out to accomplish a task	0.620
I looked for ways to increase the efficiency with which I performed my work activities	0.613
I kept a daily log of my activities	0.603
I reviewed my daily activities to see where I was wasting time	0.571
I carried an appointment book with me	0.566
I set short-term goals for what I wanted to accomplish in the coming days or weeks	0.547
If I knew I would have to spend time waiting, I brought along something I could work on	0.547
I carried a notebook to jot down notes and ideas	0.538
I reviewed my goals to determine if they needed revising	0.512
When I decided on what I would try to accomplish in the short term, I kept in	0.511



mind my long-term objectives

---

Table 16

*Descriptives for Study Composite Variables*

Scale	N	M	SD	Range	Min	Max
Present Time Perspective	94	2.95	0.61	3.07	1.29	4.36
Future Time Perspective	94	3.74	0.52	2.58	2.25	4.83
Polychronicity – MPI	94	2.81	0.82	3.45	1.00	4.45
Polychronicity – PVI	94	2.75	0.71	3.50	1.00	4.50
Time Urgency						
Competitiveness	94	3.74	0.60	2.50	2.50	5.00
Task-Related Hurry	94	3.76	0.86	4.00	1.00	5.00
General Hurry	94	3.26	0.67	3.40	1.40	4.80
Extraversion	94	3.30	0.77	3.25	1.63	4.88
Openness	94	3.95	0.63	2.80	2.20	5.00
Agreeableness	94	4.20	0.56	2.50	2.50	5.00
Neuroticism	94	3.22	0.77	3.47	1.33	4.80
Conscientious	94	3.77	0.80	3.29	1.71	5.00
Time Management	88	2.83	0.81	3.76	1.24	5.00
Multitasking	91	2.70	0.83	3.55	1.00	4.55
Pacing	88					
Early	8					
Curvilinear	38					
Steady	15					
Deadline	27					
Instructor-rated Performance	94	88.71	17.99	100.00	0.00	100.00
Self-rated Performance	87	1.51	0.67	2.00	1.00	3.00
Autonomy	93	3.60	0.80	4.00	1.00	5.00
Time Scarcity	88	3.55	0.93	3.83	1.17	5.00
Attention	94	3.12	0.80	3.50	1.33	4.83

Table 17

*Summary of Hierarchical Regression Analysis for Hypothesis 1 Predicting Time Management from Present Time Perspective (N = 85)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Step 1			
Extraversion	.13	.12	.13
Conscientiousness	.26	.11	.21
Openness	.14	.15	.10
Neuroticism	.20	.12	.19
Agreeableness	.09	.17	.06
Overall GPA	.31	.18	.18
Step 2			
Extraversion	.18	.13	.17
Conscientiousness	.13	.12	.13
Openness	.15	.14	.11
Neuroticism	.17	.12	.17
Agreeableness	.18	.18	.12
Overall GPA	.29	.18	.17
Present Time Perspective	-.25	.15	-.20

*Note.* Step 1  $R^2 = .244$  ( $p < .01$ ), adjusted  $R^2 = .186$ ; Step 2:  $\Delta R^2 = .027$  ( $p > .05$ ), adjusted  $R^2 = .204$ . \* $p < .05$ . \*\* $p < .01$ .

Table 18

*Summary of Hierarchical Regression Analysis for Hypothesis 2 Predicting Time Management from Future Time Perspective (N = 85)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Step 1			
Extraversion	0.13	0.12	0.13
Conscientiousness	0.21	0.11	0.21
Openness	0.14	0.14	0.10
Neuroticism	0.20	0.12	0.19
Agreeableness	0.09	0.17	0.06
Overall GPA	0.31	0.18	0.18
Step 2			
Extraversion	0.03	0.11	0.03
Conscientiousness	0.01	0.11	0.01
Openness	0.02	0.13	0.01
Neuroticism	0.15	0.11	0.14
Agreeableness	0.20	0.16	0.14
Overall GPA	0.10	0.17	0.06
Future Time Perspective	0.76	0.18	0.49**

*Note.* Step 1  $R^2 = .244$  ( $p < .01$ ), adjusted  $R^2 = .186$ ; Step 2:  $\Delta R^2 = .140$  ( $p < .01$ ), adjusted  $R^2 = .328$ . \* $p < .05$ . \*\* $p < .01$ .

Table 19

*Summary of Hierarchical Regression Analysis for Hypothesis 3 Predicting Time Management from Polychronicity: PVI (N = 85)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
<b>Step 1</b>			
Extraversion	0.15	0.13	0.14
Conscientiousness	0.23	0.12	0.22
Openness	0.16	0.16	0.12
Neuroticism	0.21	0.13	0.20
Agreeableness	0.06	0.19	0.04
Attentional Control	-0.05	0.13	-0.05
Overall GPA	0.32	0.18	0.18
<b>Step 2</b>			
Extraversion	0.15	0.13	0.14
Conscientiousness	0.23	0.12	0.23
Openness	0.16	0.16	0.12
Neuroticism	0.21	0.13	0.20
Agreeableness	0.06	0.19	0.04
Attentional Control	-0.05	0.14	-0.05
Overall GPA	0.32	0.19	0.18
Polychronicity: PVI	0.01	0.12	0.01

*Note.* Step 1  $R^2 = .245$  ( $p < .01$ ), adjusted  $R^2 = .176$ ; Step 2:  $\Delta R^2 = .000$  ( $p > .05$ ), adjusted  $R^2 = .245$ . \* $p < .05$ . \*\* $p < .01$ .

Table 20

*Summary of Hierarchical Regression Analysis for Hypothesis 3 Predicting Time Management from Polychronicity: MPI (N = 85)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Step 1			
Extraversion	0.15	0.13	0.14
Conscientiousness	0.23	0.12	0.22
Openness	0.16	0.16	0.12
Neuroticism	0.21	0.13	0.20
Agreeableness	0.06	0.19	0.04
Attentional Control	-0.05	0.13	-0.05
Overall GPA	0.32	0.18	0.18
Step 2			
Extraversion	0.15	0.13	0.14
Conscientiousness	0.22	0.12	0.22
Openness	0.15	0.16	0.11
Neuroticism	0.21	0.13	0.20
Agreeableness	0.08	0.19	0.05
Attentional Control	-0.04	0.14	-0.04
Overall GPA	0.32	0.19	0.19
Polychronicity: MPI	-0.04	0.10	-0.04

*Note.* Step 1  $R^2 = .245$  ( $p < .01$ ), adjusted  $R^2 = .176$ ; Step 2:  $\Delta R^2 = .002$  ( $p > .05$ ), adjusted  $R^2 = .167$ . \* $p < .05$ . \*\* $p < .01$ .

Table 21

*Summary of Hierarchical Regression Analysis for Hypothesis 4 Predicting Time Management from Time Urgency (N = 85)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
<b>Step 1</b>			
Extraversion	0.13	0.12	0.13
Conscientiousness	0.21	0.11	0.21
Openness	0.14	0.14	0.10
Neuroticism	0.20	0.12	0.19
Agreeableness	0.09	0.17	0.06
Overall GPA	0.31	0.18	0.18
<b>Step 2</b>			
Extraversion	0.04	0.14	0.03
Conscientiousness	0.10	0.14	0.09
Openness	0.08	0.15	0.06
Neuroticism	0.22	0.13	0.21
Agreeableness	0.08	0.18	0.05
Overall GPA	0.14	0.21	0.08
TU-Competitiveness	0.24	0.21	0.18
TU-Task-related Hurry	0.00	0.11	0.00
TU-General Hurry	0.18	0.15	0.15

*Note.* Step 1  $R^2 = .244$  ( $p < .01$ ), adjusted  $R^2 = .186$ ; Step 2:  $\Delta R^2 = .033$  ( $p > .05$ ), adjusted  $R^2 = .190$ . \* $p < .05$ . \*\* $p < .01$ . TU = Time Urgency.

Table 22

*Summary of Multinomial Logistic Regression Analysis for Hypothesis 5a Predicting Deadline Pacing from Present Time Perspective (N = 85)*

Pacing Behavior		<i>B</i>	<i>SE B</i>	Wald	Sig.	Odds ratio	95% CI
Early	Intercept	-8.45	6.08	1.93	0.17		
	Extraversion	-2.10	1.00	4.38	0.04	0.12	0.02, 0.88
	Conscientiousness	1.84	0.80	5.23	0.02	6.27	1.30, 30.24
	Openness	-1.36	0.92	2.19	0.14	0.26	0.04, 1.56
	Neuroticism	0.26	0.67	0.15	0.69	1.30	0.35, 4.78
	Agreeableness	0.65	0.96	0.45	0.50	1.91	0.29, 12.46
	Overall GPA	1.53	1.04	2.18	0.14	4.62	0.61, 35.25
	Present Time Perspective	1.01	0.91	1.23	0.27	2.75	0.46, 16.41
Curvilinear	Intercept	-12.57	4.24	8.79	0.00		
	Extraversion	0.70	0.49	2.06	0.15	2.02	0.77, 5.26
	Conscientiousness	0.50	0.44	1.29	0.26	1.65	0.70, 3.88
	Openness	0.35	0.54	0.43	0.51	1.42	0.50, 4.06
	Neuroticism	-0.12	0.46	0.06	0.80	0.89	0.36, 2.21
	Agreeableness	0.94	0.66	1.98	0.16	2.55	0.69, 9.37
	Overall GPA	0.87	0.66	1.73	0.19	2.38	0.65, 8.66
	Present Time Perspective	0.36	0.57	0.40	0.53	1.43	0.47, 4.37



Steady	Intercept	-17.90	5.78	9.61	0.00		
	Extraversion	0.99	0.67	2.19	0.14	2.68	0.73, 9.88
	Conscientiousness	1.74	0.73	5.60	0.02	5.68	1.35, 23.91
	Openness	0.58	0.71	0.67	0.41	1.79	0.45, 7.13
	Neuroticism	-0.43	0.62	0.49	0.49	0.65	0.19, 2.19
	Agreeableness	0.12	0.82	0.02	0.88	1.13	0.23, 5.58
	Overall GPA	1.49	0.92	2.63	0.11	4.44	0.73, 26.91
	Present Time Perspective	0.28	0.75	0.14	0.71	1.32	0.30, 5.71

*Note.* These data are compared to a referent group of Deadline Action Pacing behavior. CI = confidence interval. Nagelkerke  $R^2 = .433$ .

Table 23

*Multinomial Logistic Regression Analysis for Hypothesis 5b Predicting Early Action Pacing from Future Time Perspective (N = 85)*

Pacing Behavior		<i>B</i>	<i>SE B</i>	Wald	Sig.	Odds ratio	95% CI
Deadline	Intercept	2.72	5.61	0.23	0.63		
	Extraversion	1.63	0.98	2.78	0.10	5.12	0.75, 34.96
	Conscientiousness	-1.86	0.77	5.83	0.02	0.16	0.03, 0.71
	Openness	0.78	0.90	0.75	0.39	2.18	0.37, 12.73
	Neuroticism	-0.26	0.71	0.13	0.72	0.77	0.19, 3.10
	Agreeableness	-0.40	0.98	0.17	0.68	0.67	0.10, 4.54
	Overall GPA	-2.46	1.40	3.09	0.08	0.09	0.01, 1.33
	Future Time Perspective	2.40	1.41	2.87	0.09	10.98	0.69, 175.43
Steady	Intercept	-14.99	7.16	4.38	0.04		
	Extraversion	2.58	1.08	5.69	0.02	13.17	1.58, 109.42
	Conscientiousness	-0.36	0.97	0.14	0.71	0.70	0.10, 4.65
	Openness	1.31	1.01	1.68	0.20	3.69	0.51, 26.66
	Neuroticism	-0.76	0.80	0.90	0.34	0.47	0.10, 2.25
	Agreeableness	-0.16	1.07	0.02	0.88	0.86	0.10, 7.00
	Overall GPA	-1.16	1.54	0.57	0.45	0.31	0.02, 6.43
	Future Time Perspective	2.98	1.66	3.22	0.07	19.65	0.76, 508.10

Curvilinear	Intercept	-9.40	6.18	2.32	0.13		
	Extraversion	2.38	0.99	5.76	0.02	10.81	1.55, 75.41
	Conscientiousness	-1.58	0.80	3.94	0.05	0.21	0.04, 0.98
	Openness	1.13	0.90	1.59	0.21	3.09	0.53, 17.88
	Neuroticism	-0.46	0.71	0.43	0.51	0.63	0.16, 2.53
	Agreeableness	0.71	1.01	0.48	0.49	2.02	0.28, 14.74
	Overall GPA	-1.71	1.40	1.48	0.22	0.18	0.01, 2.83
	Future Time Perspective	2.73	1.41	3.77	0.05	15.38	0.98, 242.29

*Note.* These data are compared to a referent group of Early Action Pacing behavior. CI = confidence interval. Nagelkerke  $R^2 = .462$ .

Table 24

*Multinomial Logistic Regression Analysis for Hypothesis 5b Predicting Steady Action Pacing from Future Time Perspective*

(N = 85)

Pacing Behavior		<i>B</i>	<i>SE B</i>	Wald	Sig.	Odds ratio	95% CI
Deadline	Intercept	17.71	5.60	10.01	0.00		
	Extraversion	-0.94	0.67	2.01	0.16	0.39	0.11, 1.43
	Conscientiousness	-1.49	0.74	4.07	0.04	0.23	0.05, 0.96
	Openness	-0.53	0.74	0.50	0.48	0.59	0.14, 2.53
	Neuroticism	0.50	0.62	0.67	0.41	1.66	0.50, 5.52
	Agreeableness	-0.24	0.78	0.10	0.75	0.78	0.17, 3.58
	Overall GPA	-1.30	0.96	1.84	0.18	0.27	0.04, 1.78
	Future Time Perspective	-0.58	1.16	0.25	0.62	0.56	0.06, 5.40
Curvilinear	Intercept	5.59	4.97	1.27	0.26		
	Extraversion	-0.20	0.59	0.11	0.74	0.82	0.26, 2.63
	Conscientiousness	-1.22	0.72	2.89	0.09	0.30	0.07, 1.20
	Openness	-0.18	0.68	0.07	0.79	0.84	0.22, 3.14
	Neuroticism	0.30	0.55	0.29	0.59	1.34	0.46, 3.94
	Agreeableness	0.86	0.74	1.36	0.24	2.37	0.56, 10.04
	Overall GPA	-0.55	0.85	0.42	0.52	0.58	0.11, 3.06
	Future Time Perspective	-0.25	1.10	0.05	0.82	0.78	0.09, 6.75

Early Action	Intercept	14.99	7.16	4.38	0.04		
	Extraversion	-2.58	1.08	5.69	0.02	0.08	0.01, 0.63
	Conscientiousness	0.36	0.97	0.14	0.71	1.44	0.22, 9.59
	Openness	-1.31	1.01	1.68	0.20	0.27	0.04, 1.95
	Neuroticism	0.76	0.80	0.90	0.34	2.14	0.44, 10.27
	Agreeableness	0.16	1.07	0.02	0.89	1.17	0.14, 9.56
	Overall GPA	1.16	1.54	0.57	0.45	3.19	0.16, 65.49
	Future Time Perspective	-2.98	1.66	3.22	0.07	0.05	0.00, 1.32

*Note.* These data are compared to a referent group of Steady Pacing behavior. CI = confidence interval. Nagelkerke  $R^2 = .462$ .

Table 25

*Multinomial Logistic Regression Analysis for Hypothesis 6 Predicting Early Action Pacing from Time Urgency (N = 85)*

Pacing Behavior		<i>B</i>	<i>SE B</i>	Wald	Sig.	Odds ratio	95% CI
Deadline	Intercept	4.79	5.83	0.68	0.41		
	Extraversion	2.19	1.15	3.63	0.06	8.90	0.94, 84.41
	Conscientiousness	-1.56	0.94	2.72	0.10	0.21	0.03, 1.34
	Openness	1.49	1.02	2.14	0.14	4.44	0.60, 32.65
	Neuroticism	-0.06	0.73	0.01	0.94	0.94	0.23, 3.92
	Agreeableness	-1.28	1.02	1.59	0.21	0.28	0.04, 2.03
	Overall GPA	-1.89	1.28	2.18	0.14	0.15	0.01, 1.86
	TU-Competitiveness	0.04	1.16	0.00	0.97	1.04	0.11, 10
	TU-Task-related Hurry	0.42	0.73	0.34	0.56	1.53	0.37, 6.34
	TU-General Hurry	0.10	0.96	0.01	0.92	1.11	0.17, 7.27
Steady	Intercept	-8.27	8.18	1.02	0.31		
	Extraversion	2.46	1.33	3.43	0.06	11.74	0.87, 158.73
	Conscientiousness	-1.58	1.22	1.69	0.19	0.21	0.02, 2.23
	Openness	1.28	1.20	1.15	0.28	3.60	0.35, 37.58
	Neuroticism	-1.16	0.88	1.72	0.19	0.31	0.06, 1.77
	Agreeableness	-0.81	1.12	0.52	0.47	0.45	0.05, 4.00
	Overall GPA	-1.63	1.60	1.04	0.31	0.20	0.01, 4.47

	TU-Competitiveness	2.79	1.67	2.79	0.10	16.32	0.61, 433.21
	TU-Task-related Hurry	-1.33	0.84	2.49	0.11	0.27	0.05, 1.38
	TU-General Hurry	2.71	1.25	4.66	0.03	15.00	1.28, 175.24
Curvilinear	Intercept	-8.15	6.53	1.56	0.21		
	Extraversion	2.69	1.15	5.45	0.02	14.69	1.54, 140.30
	Conscientiousness	-1.94	0.99	3.88	0.05	0.14	0.02, 0.99
	Openness	1.72	1.01	2.89	0.09	5.60	0.77, 40.85
	Neuroticism	-0.32	0.72	0.20	0.66	0.73	0.18, 2.97
	Agreeableness	0.05	1.02	0.00	0.96	1.05	0.14, 7.67
	Overall GPA	-1.46	1.30	1.27	0.26	0.23	0.02, 2.96
	TU-Competitiveness	1.02	1.18	0.75	0.39	2.77	0.27, 27.95
	TU-Task-related Hurry	0.02	0.69	0.00	0.98	1.02	0.26, 3.98
	TU-General Hurry	1.35	0.95	2.03	0.15	3.85	0.60, 24.63

*Note.* These data are compared to a referent group of Early Action Pacing behavior. CI = confidence interval. TU = Time Urgency. Nagelkerke  $R^2 = .553$ .

Table 26

*Summary of Hierarchical Regression Analysis for Hypothesis 7 Predicting Multitasking from Polychronicity: PVI (N = 88)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Step 1			
Extraversion	0.21	0.15	0.19
Conscientiousness	0.02	0.13	0.02
Openness	-0.21	0.17	-0.16
Neuroticism	-0.02	0.15	-0.02
Agreeableness	0.20	0.21	0.13
Attentional Control	0.03	0.15	0.03
Overall GPA	0.12	0.20	0.07
Step 2			
Extraversion	0.16	0.14	0.15
Conscientiousness	0.06	0.13	0.05
Openness	-0.17	0.16	-0.13
Neuroticism	0.00	0.14	0.00
Agreeableness	0.14	0.21	0.09
Attentional Control	-0.06	0.15	-0.05
Overall GPA	0.09	0.19	0.05
Polychronicity: PVI	0.31	0.13	0.27*

*Note.* Step 1  $R^2 = .068$  ( $p > .05$ ), adjusted  $R^2 = -.014$ ; Step 2:  $\Delta R^2 = .062$  ( $p < .05$ ), adjusted  $R^2 = .041$ . \* $p < .05$ . \*\* $p < .01$ .



Table 27

*Summary of Hierarchical Regression Analysis for Hypothesis 7 Predicting Multitasking from Polychronicity: MPI (N = 88)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
<b>Step 1</b>			
Extraversion	0.21	0.15	0.19
Conscientiousness	0.02	0.13	0.02
Openness	-0.21	0.17	-0.16
Neuroticism	-0.02	0.15	-0.02
Agreeableness	0.20	0.21	0.13
Attentional Control	0.03	0.15	0.03
Overall GPA	0.12	0.20	0.07
<b>Step 2</b>			
Extraversion	0.19	0.14	0.17
Conscientiousness	0.07	0.13	0.07
Openness	-0.15	0.17	-0.11
Neuroticism	-0.01	0.15	-0.01
Agreeableness	0.11	0.21	0.07
Attentional Control	-0.05	0.15	-0.05
Overall GPA	0.12	0.20	0.07
Polychronicity: MPI	0.25	0.11	0.24*

*Note.* Step 1  $R^2 = .068$  ( $p > .05$ ), adjusted  $R^2 = -.014$ ; Step 2:  $\Delta R^2 = .051$  ( $p < .05$ ), adjusted  $R^2 = .119$ . \* $p < .05$ . \*\* $p < .01$ .

Table 28

*Summary of Hierarchical Regression Analysis for Hypothesis 8 Predicting Multitasking from Time Urgency (N = 88)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
<b>Step 1</b>			
Extraversion	0.21	0.15	0.19
Conscientiousness	0.02	0.13	0.02
Openness	-0.21	0.17	-0.16
Neuroticism	-0.02	0.15	-0.02
Agreeableness	0.20	0.21	0.13
Attentional Control	0.03	0.15	0.03
Overall GPA	0.12	0.20	0.07
<b>Step 2</b>			
Extraversion	0.20	0.16	0.18
Conscientiousness	0.11	0.16	0.10
Openness	-0.21	0.17	-0.16
Neuroticism	-0.02	0.15	-0.02
Agreeableness	0.15	0.22	0.10
Attentional Control	0.12	0.16	0.12
Overall GPA	0.11	0.22	0.07
TU-Competitiveness	0.05	0.23	0.04
TU-Task-related Hurry	0.08	0.13	0.08
TU-General Hurry	-0.30	0.17	-0.24

*Note.* Step 1  $R^2 = .068$  ( $p > .05$ ), adjusted  $R^2 = -.014$ ; Step 2:  $\Delta R^2 = .037$  ( $p > .05$ ),

adjusted  $R^2 = -.012$ .  $*p < .05$ .  $**p < .01$ .

Table 29

*Summary of Hierarchical Regression Analysis for Hypothesis 9 Predicting Time Management from Time Scarcity (N = 85)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Step 1			
Extraversion	0.13	0.12	0.13
Conscientiousness	0.21	0.11	0.21
Openness	0.14	0.14	0.10
Neuroticism	0.20	0.12	0.19
Agreeableness	0.09	0.17	0.06
Overall GPA	0.31	0.18	0.18
Step 2			
Extraversion	0.13	0.12	0.12
Conscientiousness	0.21	0.11	0.21
Openness	0.13	0.15	0.10
Neuroticism	0.20	0.13	0.19
Agreeableness	0.10	0.19	0.07
Overall GPA	0.31	0.18	0.18
Time Scarcity	-0.01	0.10	-0.01

*Note.* Step 1  $R^2 = .244$  ( $p < .01$ ), adjusted  $R^2 = .186$ ; Step 2:  $\Delta R^2 = .000$  ( $p > .05$ ), adjusted  $R^2 = .175$ . \* $p < .05$ . \*\* $p < .01$ .

Table 30

*Summary of Hierarchical Regression Analysis for Hypothesis 10 Predicting Multitasking from Time Scarcity (N = 85)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
<b>Step 1</b>			
Extraversion	0.25	0.15	0.23
Conscientiousness	-0.01	0.14	-0.01
Openness	-0.16	0.18	-0.12
Neuroticism	0.00	0.15	0.00
Agreeableness	0.17	0.21	0.11
Attentional Control	0.02	0.15	0.02
Overall GPA	0.16	0.21	0.09
<b>Step 2</b>			
Extraversion	0.27	0.15	0.24
Conscientiousness	0.02	0.13	0.02
Openness	-0.14	0.18	-0.10
Neuroticism	-0.01	0.15	-0.01
Agreeableness	0.00	0.23	0.00
Attentional Control	0.04	0.15	0.04
Overall GPA	0.13	0.21	0.07
Time Scarcity	0.23	0.11	0.25*

*Note.* Step 1  $R^2 = .077$  ( $p > .01$ ), adjusted  $R^2 = -.007$ ; Step 2:  $\Delta R^2 = .050$  ( $p < .05$ ), adjusted  $R^2 = .035$ . \* $p < .05$ . \*\* $p < .01$ .

Table 31

*Summary of Hierarchical Regression Analysis for Hypothesis 11a Predicting Autonomy  
Moderates the Present Time Perspective-Time Management Relationship (N = 84)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
<b>Step 1</b>			
Extraversion	0.13	0.12	0.12
Conscientiousness	0.22	0.11	0.21
Openness	0.13	0.15	0.10
Neuroticism	0.20	0.13	0.19
Agreeableness	0.09	0.17	0.06
Overall GPA	0.31	0.18	0.18
<b>Step 2</b>			
Extraversion	0.20	0.13	0.19
Conscientiousness	0.11	0.12	0.11
Openness	0.14	0.15	0.10
Neuroticism	0.16	0.13	0.16
Agreeableness	0.17	0.18	0.11
Overall GPA	0.29	0.18	0.17
Present Time Perspective	-0.28	0.15	-0.21
Autonomy	0.09	0.11	0.09
<b>Step 3</b>			
Extraversion	0.24	0.13	0.22
Conscientiousness	0.08	0.13	0.08
Openness	0.14	0.15	0.11

Neuroticism	0.17	0.13	0.17
Agreeableness	0.15	0.18	0.11
Overall GPA	0.31	0.18	0.18
Present Time Perspective	-0.30	0.16	-0.23
Autonomy	0.13	0.12	0.12
Present Time Perspective*Autonomy	0.17	0.16	0.11

*Note.* Step 1  $R^2 = .243$  ( $p < .01$ ), adjusted  $R^2 = .184$ ; Step 2:  $\Delta R^2 = .034$  ( $p > .05$ ), adjusted  $R^2 = .199$ ; Step 3:  $\Delta R^2 = .011$  ( $p > .05$ ), adjusted  $R^2 = .201$ . \* $p < .05$ . \*\* $p < .01$ .

Table 32

*Summary of Hierarchical Regression Analysis for Hypothesis 11a Predicting Autonomy  
Moderates the Future Time Perspective-Time Management Relationship (N = 84)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
<b>Step 1</b>			
Extraversion	0.13	0.12	0.12
Conscientiousness	0.22	0.11	0.21
Openness	0.13	0.15	0.10
Neuroticism	0.20	0.13	0.19
Agreeableness	0.09	0.17	0.06
Overall GPA	0.31	0.18	0.18
<b>Step 2</b>			
Extraversion	0.04	0.12	0.04
Conscientiousness	-0.01	0.11	-0.01
Openness	0.01	0.14	0.01
Neuroticism	0.14	0.12	0.14
Agreeableness	0.18	0.16	0.13
Overall GPA	0.10	0.17	0.06
Future Time Perspective	0.78	0.18	0.50
Autonomy	0.09	0.10	0.08
<b>Step 3</b>			
Extraversion	0.05	0.12	0.05
Conscientiousness	-0.01	0.11	-0.01
Openness	0.01	0.14	0.01



Neuroticism	0.15	0.12	0.14
Agreeableness	0.18	0.16	0.12
Overall GPA	0.12	0.18	0.07
Future Time Perspective	0.77	0.19	0.50
Autonomy	0.10	0.10	0.09
Future Time Perspective*Autonomy	-0.07	0.18	-0.04

*Note.* Step 1  $R^2 = .243$  ( $p < .01$ ), adjusted  $R^2 = .184$ ; Step 2:  $\Delta R^2 = .146$  ( $p < .01$ ), adjusted  $R^2 = .324$ ; Step 3:  $\Delta R^2 = .001$  ( $p > .05$ ), adjusted  $R^2 = .390$ . \* $p < .05$ . \*\* $p < .01$ .

Table 33

*Multinomial Logistic Regression Analysis for Hypothesis 11b Predicting Autonomy Moderates the Present Time Perspective-Pacing Relationship (N = 84)*

Pacing Behavior		<i>B</i>	<i>SE B</i>	Wald	Sig.	Odds ratio	95% CI
Early	Intercept	-5.59	5.11	1.19	0.27		
	Extraversion	-2.08	1.07	3.77	0.05	0.12	0.02, 1.02
	Conscientiousness	1.85	0.82	5.10	0.02	6.33	1.28, 31.43
	Openness	-1.38	0.93	2.18	0.14	0.25	0.04, 1.57
	Neuroticism	0.28	0.68	0.17	0.68	1.33	0.35, 5.02
	Agreeableness	0.73	1.03	0.50	0.48	2.08	0.28, 15.77
	Overall GPA	1.43	1.05	1.84	0.17	4.17	0.53, 32.74
	Present Time Perspective	0.94	0.94	1.01	0.32	2.55	0.41, 15.97
	Present*Autonomy	0.46	1.08	0.18	0.67	1.59	0.19, 13.29
Curvilinear	Intercept	-12.43	4.12	9.10	0.00		
	Extraversion	0.91	0.53	3.03	0.08	2.49	0.89, 6.98
	Conscientiousness	0.41	0.46	0.80	0.37	1.51	0.61, 3.72
	Openness	0.40	0.57	0.50	0.48	1.50	0.49, 4.54
	Neuroticism	-0.06	0.47	0.02	0.90	0.94	0.37, 2.38
	Agreeableness	0.89	0.68	1.73	0.19	2.43	0.65, 9.13
	Overall GPA	0.96	0.67	2.04	0.15	2.61	0.70, 9.77

Steady	Present Time Perspective	0.36	0.58	0.38	0.54	1.43	0.46, 4.49
	Present*Autonomy	1.17	0.65	3.19	0.07	3.21	0.89, 11.52
	Intercept	-17.91	5.52	10.52	0.00		
	Extraversion	1.19	0.70	2.88	0.09	3.28	0.83, 12.98
	Conscientiousness	1.66	0.75	4.86	0.03	5.24	1.20, 22.85
	Openness	0.67	0.73	0.83	0.36	1.95	0.46, 8.2
	Neuroticism	-0.37	0.63	0.34	0.56	0.69	0.20, 2.38
	Agreeableness	0.04	0.82	0.00	0.97	1.04	0.21, 5.16
	Overall GPA	1.56	0.95	2.71	0.10	4.75	0.74, 30.39
	Present Time Perspective	0.22	0.76	0.09	0.77	1.25	0.28, 5.53
Present*Autonomy	1.12	0.76	2.18	0.14	3.07	0.69, 13.62	

*Note.* These data are compared to a referent group of Deadline Action Pacing behavior. CI = confidence interval. Nagelkerke  $R^2 = .460$ .

Table 34

*Multinomial Logistic Regression Analysis for Hypothesis 11b Predicting Autonomy Moderates the Future Time Perspective-Pacing Relationship (N = 84)*

Pacing Behavior		<i>B</i>	<i>SE B</i>	Wald	Sig.	Odds ratio	95% CI
Deadline	Intercept	10.44	6.75	2.39	0.12		
	Extraversion	2.53	1.30	3.76	0.05	12.51	0.97, 160.61
	Conscientiousness	-2.17	0.89	6.01	0.01	0.11	0.02, 0.65
	Openness	1.19	1.02	1.38	0.24	3.30	0.45, 24.25
	Neuroticism	-0.09	0.75	0.01	0.91	0.92	0.21, 3.97
	Agreeableness	-1.08	1.18	0.84	0.36	0.34	0.03, 3.41
	Overall GPA	-2.19	1.45	2.29	0.13	0.11	0.01, 1.91
	Future Time Perspective	2.59	1.43	3.30	0.07	13.36	0.81, 219.27
	Future*Autonomy	-2.34	1.42	2.72	0.10	0.10	0.01, 1.55
Steady	Intercept	-5.01	8.55	0.34	0.56		
	Extraversion	3.48	1.38	6.34	0.01	32.47	2.16, 487.42
	Conscientiousness	-0.69	1.08	0.41	0.52	0.50	0.06, 4.15
	Openness	1.72	1.14	2.27	0.13	5.57	0.60, 52.01
	Neuroticism	-0.60	0.86	0.50	0.48	0.55	0.10, 2.93
	Agreeableness	-0.86	1.25	0.47	0.49	0.42	0.04, 4.92
	Overall GPA	-0.86	1.60	0.29	0.59	0.42	0.02, 9.71

Curvilinear	Future Time Perspective	3.20	1.68	3.61	0.06	24.50	0.90, 664.81
	Future*Autonomy	-2.37	1.60	2.18	0.14	0.09	0.00, 2.17
	Intercept	-1.25	7.25	0.03	0.86		
	Extraversion	3.36	1.32	6.51	0.01	28.75	2.18, 379.75
	Conscientiousness	-1.88	0.92	4.14	0.04	0.15	0.03, 0.93
	Openness	1.59	1.03	2.37	0.12	4.89	0.65, 36.84
	Neuroticism	-0.27	0.76	0.13	0.72	0.76	0.17, 3.37
	Agreeableness	-0.02	1.20	0.00	0.99	0.98	0.09, 10.41
	Overall GPA	-1.33	1.47	0.83	0.36	0.26	0.01, 4.67
	Future Time Perspective	2.91	1.43	4.14	0.04	18.42	1.11, 304.63
	Future*Autonomy	-2.89	1.47	3.86	0.05	0.06	0.00, 0.99

*Note.* These data are compared to a referent group of Early Action Pacing behavior. CI = confidence interval. Nagelkerke  $R^2 = .492$ .

Table 35

*Multinomial Logistic Regression Analysis for Hypothesis 11b Predicting Autonomy Moderates the Future Time Perspective-Pacing Relationship (N = 84)*

Pacing Behavior		<i>B</i>	<i>SE B</i>	Wald	Sig.	Odds ratio	95% CI
Deadline	Intercept	15.45	6.49	5.67	0.02		
	Extraversion	-0.95	0.69	1.90	0.17	0.39	0.10, 1.50
	Conscientiousness	-1.48	0.74	3.99	0.05	0.23	0.05, 0.97
	Openness	-0.52	0.75	0.48	0.49	0.59	0.13, 2.60
	Neuroticism	0.51	0.63	0.66	0.42	1.67	0.48, 5.78
	Agreeableness	-0.21	0.77	0.08	0.78	0.81	0.18, 3.64
	Overall GPA	-1.33	0.97	1.88	0.17	0.27	0.04, 1.77
	Future Time Perspective	-0.61	1.17	0.27	0.60	0.55	0.05, 5.42
	Future*Autonomy	0.03	0.98	0.00	0.97	1.03	0.15, 7.09
	Steady	Intercept	3.76	5.83	0.41	0.52	
Extraversion		-0.12	0.61	0.04	0.84	0.89	0.27, 2.94
Conscientiousness		-1.19	0.72	2.71	0.10	0.31	0.07, 1.25
Openness		-0.13	0.68	0.04	0.85	0.88	0.23, 3.36
Neuroticism		0.33	0.57	0.34	0.56	1.39	0.46, 4.24
Agreeableness		0.85	0.73	1.34	0.25	2.33	0.56, 9.78
Overall GPA		-0.47	0.86	0.30	0.59	0.63	0.12, 3.38

Curvilinear	Future Time Perspective	-0.29	1.12	0.07	0.80	0.75	0.08, 6.69
	Future*Autonomy	-0.52	0.79	0.42	0.51	0.60	0.13, 2.83
	Intercept	5.01	8.55	0.34	0.56		
	Extraversion	-3.48	1.38	6.34	0.01	0.03	0.00, 0.46
	Conscientiousness	0.69	1.08	0.41	0.52	2.00	0.24, 16.55
	Openness	-1.72	1.14	2.27	0.13	0.18	0.02, 1.68
	Neuroticism	0.60	0.86	0.50	0.48	1.83	0.34, 9.76
	Agreeableness	0.86	1.25	0.47	0.49	2.37	0.20, 27.64
	Overall GPA	0.86	1.60	0.29	0.59	2.37	0.10, 54.58
	Future Time Perspective	-3.20	1.68	3.61	0.06	0.04	0.00, 1.11
	Future*Autonomy	2.37	1.60	2.18	0.14	10.70	0.46, 247.88

*Note.* These data are compared to a referent group of Steady Pacing behavior. CI = confidence interval. Nagelkerke  $R^2 = .492$ .

Table 36

*Summary of Hierarchical Regression Analysis for Hypothesis 11c Predicting Autonomy  
Moderates the Polychronicity-Time Management Relationship: PVI (N = 84)*

Variable	<i>B</i>	<i>SE B</i>	<i>B</i>
<b>Step 1</b>			
Extraversion	0.23	0.15	0.21
Conscientiousness	0.01	0.13	0.00
Openness	-0.19	0.17	-0.14
Neuroticism	0.00	0.15	0.00
Agreeableness	0.19	0.21	0.12
Attentional Control	0.03	0.15	0.03
Overall GPA	0.11	0.20	0.06
<b>Step 2</b>			
Extraversion	0.15	0.14	0.14
Conscientiousness	0.07	0.13	0.06
Openness	-0.14	0.17	-0.10
Neuroticism	0.03	0.14	0.02
Agreeableness	0.17	0.21	0.11
Attentional Control	-0.05	0.15	-0.05
Overall GPA	0.09	0.19	0.05
PVI	0.29	0.13	0.25*
Autonomy	-0.14	0.12	-0.13
<b>Step 3</b>			
Extraversion	0.14	0.15	0.13



Conscientiousness	0.06	0.13	0.05
Openness	-0.15	0.17	-0.11
Neuroticism	0.04	0.15	0.04
Agreeableness	0.16	0.21	0.11
Attentional Control	-0.07	0.15	-0.07
Overall GPA	0.12	0.20	0.07
PVI	0.31	0.13	0.26*
Autonomy	-0.16	0.12	-0.15
PVI*Autonomy	-0.13	0.14	-0.10

*Note.* Step 1  $R^2 = .073$  ( $p < .01$ ), adjusted  $R^2 = -.010$ ; Step 2:  $\Delta R^2 = .070$  ( $p > .05$ ), adjusted  $R^2 = .143$ ; Step 3:  $\Delta R^2 = .010$  ( $p > .05$ ), adjusted  $R^2 = .041$ . \* $p < .05$ . \*\* $p < .01$ .

Table 37

*Summary of Hierarchical Regression Analysis for Hypothesis 11c Predicting Autonomy  
Moderates the Polychronicity-Time Management Relationship: MPI (N = 84)*

Variable	<i>B</i>	<i>SE B</i>	<i>B</i>
<b>Step 1</b>			
Extraversion	0.15	0.13	0.14
Conscientiousness	0.23	0.12	0.23
Openness	0.15	0.16	0.12
Neuroticism	0.21	0.13	0.20
Agreeableness	0.06	0.19	0.04
Attentional Control	-0.05	0.14	-0.05
Overall GPA	0.32	0.19	0.18
<b>Step 2</b>			
Extraversion	0.16	0.13	0.15
Conscientiousness	0.21	0.12	0.21
Openness	0.14	0.16	0.11
Neuroticism	0.21	0.13	0.20
Agreeableness	0.06	0.19	0.04
Attentional Control	-0.04	0.14	-0.04
Overall GPA	0.33	0.19	0.19
MPI	-0.04	0.10	-0.04
Autonomy	0.06	0.11	0.06
<b>Step 3</b>			
Extraversion	0.19	0.13	0.18

Conscientiousness	0.20	0.12	0.20
Openness	0.16	0.16	0.12
Neuroticism	0.18	0.13	0.17
Agreeableness	0.08	0.19	0.05
Attentional Control	0.00	0.14	0.00
Overall GPA	0.29	0.19	0.17
MPI	-0.11	0.11	-0.11
Autonomy	0.10	0.11	0.09
MPI*Autonomy	0.22	0.12	0.20

*Note.* Step 1  $R^2 = .244$  ( $p < .01$ ), adjusted  $R^2 = .174$ ; Step 2:  $\Delta R^2 = .004$  ( $p > .05$ ), adjusted  $R^2 = .249$ ; Step 3:  $\Delta R^2 = .033$  ( $p > .05$ ), adjusted  $R^2 = .183$ . \* $p < .05$ . \*\* $p < .01$ .

Table 38

*Summary of Hierarchical Regression Analysis for Hypothesis 11d Predicting Autonomy  
Moderates the Polychronicity-Multitasking Relationship: PVI (N = 87)*

Variable	<i>B</i>	<i>SE B</i>	<i>B</i>
<b>Step 1</b>			
Extraversion	0.23	0.15	0.21
Conscientiousness	0.01	0.13	0.00
Openness	-0.19	0.17	-0.14
Neuroticism	0.00	0.15	0.00
Agreeableness	0.19	0.21	0.12
Attentional Control	0.03	0.15	0.03
Overall GPA	0.11	0.20	0.06
<b>Step 2</b>			
Extraversion	0.15	0.14	0.14
Conscientiousness	0.07	0.13	0.06
Openness	-0.14	0.17	-0.10
Neuroticism	0.03	0.14	0.02
Agreeableness	0.17	0.21	0.11
Attentional Control	-0.05	0.15	-0.05
Overall GPA	0.09	0.19	0.05
PVI	0.29	0.13	0.25*
Autonomy	-0.14	0.12	-0.13
<b>Step 3</b>			
Extraversion	0.14	0.15	0.13

Conscientiousness	0.06	0.13	0.05
Openness	-0.15	0.17	-0.11
Neuroticism	0.04	0.15	0.04
Agreeableness	0.16	0.21	0.11
Attentional Control	-0.07	0.15	-0.07
Overall GPA	0.12	0.20	0.07
PVI	0.31	0.13	0.26*
Autonomy	-0.16	0.12	-0.15
PVI*Autonomy	-0.13	0.14	-0.10

*Note.* Step 1  $R^2 = .073$  ( $p < .01$ ), adjusted  $R^2 = -.010$ ; Step 2:  $\Delta R^2 = .070$  ( $p > .05$ ), adjusted  $R^2 = .143$ ; Step 3:  $\Delta R^2 = .010$  ( $p > .05$ ), adjusted  $R^2 = .041$ . \* $p < .05$ . \*\* $p < .01$ .

Table 39

*Summary of Hierarchical Regression Analysis for Hypothesis 11d Predicting Autonomy  
Moderates the Polychronicity-Multitasking Relationship: MPI (N = 87)*

Variable	<i>B</i>	<i>SE B</i>	<i>B</i>
<b>Step 1</b>			
Extraversion	0.23	0.15	0.21
Conscientiousness	0.01	0.13	0.00
Openness	-0.19	0.17	-0.14
Neuroticism	0.00	0.15	0.00
Agreeableness	0.19	0.21	0.12
Attentional Control	0.03	0.15	0.03
Overall GPA	0.11	0.20	0.06
<b>Step 2</b>			
Extraversion	0.18	0.14	0.17
Conscientiousness	0.08	0.13	0.07
Openness	-0.12	0.17	-0.09
Neuroticism	0.01	0.15	0.01
Agreeableness	0.14	0.21	0.09
Attentional Control	-0.05	0.15	-0.05
Overall GPA	0.11	0.19	0.06
MPI	0.23	0.11	0.23*
Autonomy	-0.13	0.12	-0.12
<b>Step 3</b>			
Extraversion	0.18	0.15	0.17

Conscientiousness	0.08	0.14	0.07
Openness	-0.12	0.17	-0.09
Neuroticism	0.01	0.15	0.01
Agreeableness	0.14	0.21	0.09
Attentional Control	-0.05	0.16	-0.05
Overall GPA	0.11	0.20	0.06
MPI	0.23	0.12	0.23
Autonomy	-0.13	0.12	-0.12
MPI*Autonomy	0.00	0.13	0.00

*Note.* Step 1  $R^2 = .073$  ( $p > .05$ ), adjusted  $R^2 = -.010$ ; Step 2:  $\Delta R^2 = .061$  ( $p > .05$ ), adjusted  $R^2 = .033$ ; Step 3:  $\Delta R^2 = .000$  ( $p > .05$ ), adjusted  $R^2 = .020$ . \* $p < .05$ . \*\* $p < .01$ .

Table 40

*Summary of Hierarchical Regression Analysis for Hypothesis 11e Predicting Autonomy  
Moderates the Time Urgency-Time Management Relationship (N = 84)*

Variable	<i>B</i>	<i>SE B</i>	<i>B</i>
<b>Step 1</b>			
Extraversion	.13	.12	.12
Conscientiousness	.22	.11	.21
Openness	.14	.15	.10
Neuroticism	.20	.13	.19
Agreeableness	.09	.17	.06
Overall GPA	.31	.18	.18
<b>Step 2</b>			
Extraversion	.05	.14	.05
Conscientiousness	.09	.14	.09
Openness	.08	.15	.06
Neuroticism	.22	.13	.21
Agreeableness	.06	.19	.04
Overall GPA	.14	.21	.08
TU-Competitiveness	.23	.21	.17
TU-Task-related Hurry	.02	.12	.02
TU-General Hurry	.19	.15	.16
Autonomy	.07	.11	.07
<b>Step 3</b>			
Extraversion	.06	.15	.06



Conscientiousness	.10	.15	.10
Openness	.07	.16	.06
Neuroticism	.21	.14	.20
Agreeableness	.04	.19	.03
Overall GPA	.11	.23	.06
TU-Competitiveness	.23	.22	.17
TU-Task-related Hurry	.05	.12	.05
TU-General Hurry	.18	.15	.15
Autonomy	.11	.13	.10
TU-Competitiveness *Autonomy	.07	.18	.04
TU-Task-related Hurry*Autonomy	-.11	.13	-.10
TU-General Hurry*Autonomy	.03	.18	.02

*Note.* Step 1  $R^2 = .243$  ( $p < .01$ ), adjusted  $R^2 = .184$ ; Step 2:  $\Delta R^2 = .037$  ( $p > .05$ ), adjusted  $R^2 = .181$ ; Step 3:  $\Delta R^2 = .011$  ( $p > .05$ ), adjusted  $R^2 = .159$ . \* $p < .05$ . \*\* $p < .01$ . TU = Time Urgency.

Table 41

*Multinomial Logistic Regression Analysis for Hypothesis 12f Predicting Autonomy Moderates the Time Urgency-Pacing Relationship (N = 86)*

Pacing Behavior		<i>B</i>	<i>SE B</i>	Wald	Sig.	Odds ratio	95% CI
Deadline	Intercept	1.95	5.82	0.11	0.74		
	Extraversion	2.63	1.26	4.38	0.04	13.83	1.18, 161.96
	Conscientiousness	-2.49	1.37	3.32	0.07	0.08	0.01, 1.21
	Openness	1.97	1.17	2.82	0.09	7.17	0.72, 71.41
	Neuroticism	0.00	0.89	0.00	1.00	1.00	0.17, 5.78
	Agreeableness	-1.53	1.25	1.51	0.22	0.22	0.02, 2.49
	TU-Competitiveness	-1.11	1.21	0.84	0.36	0.33	0.03, 3.52
	TU-Task-related Hurry	0.73	0.88	0.68	0.41	2.07	0.37, 11.68
	TU-General Hurry	0.57	1.19	0.23	0.63	1.77	0.17, 18.37
	TU-Comp*Autonomy	-2.24	1.57	2.03	0.15	0.11	0.00, 2.31
	TU-Task-related Hurry*Autonomy	-0.59	0.88	0.45	0.50	0.56	0.10, 3.09
	TU-General Hurry*Autonomy	1.99	1.17	2.89	0.09	7.33	0.74, 72.94
	Steady	Intercept	-12.26	7.18	2.92	0.09	
Extraversion		2.92	1.35	4.69	0.03	18.5	1.32, 259.43
Conscientiousness		-1.98	1.53	1.67	0.20	0.14	0.01, 2.77

Curvilinear	Openness	2.18	1.30	2.82	0.09	8.82	0.70, 111.59
	Neuroticism	-0.80	0.98	0.65	0.42	0.45	0.07, 3.10
	Agreeableness	-1.15	1.32	0.77	0.38	0.32	0.02, 4.15
	TU-Competitiveness	1.19	1.39	0.73	0.39	3.28	0.21, 50.27
	TU-Task-related Hurry	-0.66	0.94	0.49	0.48	0.52	0.08, 3.25
	TU-General Hurry	2.64	1.32	4.01	0.05	14.01	1.06, 185.77
	TU-Comp*Autonomy	-1.41	1.58	0.80	0.37	0.24	0.01, 5.41
	TU-Task-related Hurry*Autonomy	-0.50	0.89	0.32	0.57	0.61	0.11, 3.48
	TU-General Hurry*Autonomy	1.06	1.26	0.71	0.40	2.89	0.24, 34.18
	Intercept	-10.30	6.31	2.66	0.10		
	Extraversion	2.96	1.24	5.66	0.02	19.27	1.68, 220.71
	Conscientiousness	-2.92	1.39	4.40	0.04	0.05	0.00, 0.83
	Openness	2.37	1.18	4.06	0.04	10.68	1.07, 106.91
	Neuroticism	-0.10	0.87	0.01	0.91	0.91	0.17, 4.99
	Agreeableness	-0.49	1.25	0.15	0.70	0.62	0.05, 7.09
	TU-Competitiveness	0.25	1.19	0.04	0.84	1.28	0.12, 13.11
	TU-Task-related Hurry	0.33	0.86	0.15	0.70	1.39	0.26, 7.50
	TU-General Hurry	1.80	1.17	2.35	0.12	6.04	0.61, 59.98
	TU-Comp*Autonomy	-2.09	1.49	1.97	0.16	0.12	0.01, 2.30
	TU-Task-related Hurry*Autonomy	-0.62	0.83	0.57	0.45	0.54	0.11, 2.72
TU-General Hurry*Autonomy	1.29	1.13	1.30	0.25	3.63	0.39, 33.40	

*Note.* These data are compared to a referent group of Early Action Pacing behavior. CI = confidence interval. TU = Time Urgency, Comp = Competitiveness. Nagelkerke  $R^2 = .564$ .

Table 42

*Summary of Hierarchical Regression Analysis for Hypothesis 11g Predicting Autonomy  
Moderates the Time Urgency-Multitasking Relationship (N = 87)*

Variable	<i>B</i>	<i>SE B</i>	<i>B</i>
<b>Step 1</b>			
Extraversion	0.23	0.15	0.21
Conscientiousness	0.01	0.13	0.00
Openness	-0.19	0.17	-0.14
Neuroticism	0.00	0.15	0.00
Agreeableness	0.19	0.21	0.12
Attentional Control	0.03	0.15	0.03
Overall GPA	0.11	0.20	0.06
<b>Step 2</b>			
Extraversion	0.18	0.16	0.16
Conscientiousness	0.11	0.16	0.10
Openness	-0.17	0.17	-0.13
Neuroticism	0.00	0.15	0.00
Agreeableness	0.17	0.22	0.11
Attentional Control	0.11	0.16	0.10
Overall GPA	0.10	0.22	0.06
TU-Competitiveness	0.09	0.23	0.07
TU-Task-related Hurry	0.05	0.13	0.05
TU-General Hurry	-0.29	0.18	-0.23

Autonomy	-0.16	0.13	-0.15
Step 3			
Extraversion	0.18	0.16	0.17
Conscientiousness	0.03	0.16	0.03
Openness	-0.18	0.17	-0.13
Neuroticism	0.04	0.15	0.04
Agreeableness	0.21	0.21	0.14
Attentional Control	0.16	0.16	0.16
Overall GPA	0.20	0.22	0.12
TU-Competitiveness	0.04	0.23	0.03
TU-Task-related Hurry	0.05	0.14	0.05
TU-General Hurry	-0.28	0.17	-0.23
Autonomy	-0.17	0.14	-0.16
TU-Competitiveness *Autonomy	-0.27	0.20	-0.17
TU-Task-related Hurry*Autonomy	0.10	0.14	0.10
TU-General Hurry*Autonomy	-0.25	0.19	-0.16

*Note.* Step 1  $R^2 = .073$  ( $p > .05$ ), adjusted  $R^2 = -.010$ ; Step 2:  $\Delta R^2 = .050$  ( $p > .05$ ), adjusted  $R^2 = -.001$ ; Step 3:  $\Delta R^2 = .077$  ( $p > .05$ ), adjusted  $R^2 = .044$ . \* $p < .05$ . \*\* $p < .01$ .

Table 43

*Summary of Hierarchical Regression Analysis for Hypothesis 12a Predicting Time Scarcity Moderates the Present Time Perspective-Time Management Relationship (N = 85)*

Variable	<i>B</i>	<i>SE B</i>	<i>B</i>
Step 1			
Extraversion	0.13	0.12	0.13
Conscientiousness	0.21	0.11	0.21
Openness	0.14	0.14	0.10
Neuroticism	0.20	0.12	0.19
Agreeableness	0.09	0.17	0.06
Overall GPA	0.31	0.18	0.18
Step 2			
Extraversion	0.18	0.13	0.17
Conscientiousness	0.12	0.12	0.12
Openness	0.14	0.14	0.10
Neuroticism	0.17	0.12	0.16
Agreeableness	0.22	0.20	0.15
Overall GPA	0.29	0.18	0.17
Present Time Perspective	-0.26	0.15	-0.20
Time Scarcity	-0.04	0.10	-0.04
Step 3			
Extraversion	0.18	0.13	0.17
Conscientiousness	0.12	0.12	0.12

Openness	0.14	0.15	0.10
Neuroticism	0.17	0.13	0.17
Agreeableness	0.22	0.20	0.15
Overall GPA	0.30	0.18	0.17
Present Time Perspective	-0.26	0.15	-0.20
Time Scarcity	-0.04	0.10	-0.04
Present Time Perspective*Time Scarcity	0.03	0.13	0.02

*Note.* Step 1  $R^2 = .244$  ( $p < .01$ ), adjusted  $R^2 = .186$ ; Step 2:  $\Delta R^2 = .028$  ( $p > .05$ ), adjusted  $R^2 = .120$ ; Step 3:  $\Delta R^2 = .000$  ( $p > .05$ ), adjusted  $R^2 = .185$ . \* $p < .05$ . \*\* $p < .01$ .



Table 44

*Summary of Hierarchical Regression Analysis for Hypothesis 12a Predicting Time Scarcity Moderates the Future Time Perspective-Time Management Relationship (N = 85)*

Variable	<i>B</i>	<i>SE B</i>	<i>B</i>
Step 1			
Extraversion	0.13	0.12	0.13
Conscientiousness	0.21	0.11	0.21
Openness	0.14	0.14	0.10
Neuroticism	0.20	0.12	0.19
Agreeableness	0.09	0.17	0.06
Overall GPA	0.31	0.18	0.18
Step 2			
Extraversion	0.03	0.12	0.02
Conscientiousness	0.00	0.11	0.00
Openness	0.01	0.14	0.01
Neuroticism	0.15	0.11	0.14
Agreeableness	0.24	0.18	0.16
Overall GPA	0.10	0.17	0.06
Future Time Perspective	0.77	0.18	0.50**
Time Scarcity	-0.05	0.09	-0.05
Step 3			
Extraversion	0.00	0.12	0.00
Conscientiousness	0.01	0.11	0.01

Openness	0.00	0.14	0.00
Neuroticism	0.16	0.11	0.15
Agreeableness	0.22	0.18	0.15
Overall GPA	0.12	0.17	0.07
Future Time Perspective	0.75	0.18	0.48**
Time Scarcity	-0.02	0.09	-0.03
Future Time Perspective*Time Scarcity	-0.19	0.17	-0.11

*Note.* Step 1  $R^2 = .244$  ( $p < .01$ ), adjusted  $R^2 = .186$ ; Step 2:  $\Delta R^2 = .142$  ( $p < .01$ ), adjusted  $R^2 = .322$ ; Step 3:  $\Delta R^2 = .011$  ( $p > .05$ ), adjusted  $R^2 = .325$ . \* $p < .05$ . \*\* $p < .01$ .

Table 45

*Summary of Hierarchical Regression Analysis for Hypothesis 12b Predicting Time Scarcity Moderates the Polychronicity-Time Management Relationship: PVI (N = 85)*

Variable	<i>B</i>	<i>SE B</i>	<i>B</i>
<b>Step 1</b>			
Extraversion	0.15	0.13	0.14
Conscientiousness	0.23	0.12	0.22
Openness	0.16	0.16	0.12
Neuroticism	0.21	0.13	0.20
Agreeableness	0.06	0.19	0.04
Attentional Control	-0.05	0.13	-0.05
Overall GPA	0.32	0.18	0.18
<b>Step 2</b>			
Extraversion	0.14	0.13	0.14
Conscientiousness	0.23	0.12	0.22
Openness	0.16	0.16	0.12
Neuroticism	0.21	0.13	0.20
Agreeableness	0.07	0.20	0.05
Attentional Control	-0.05	0.14	-0.05
Overall GPA	0.32	0.19	0.19
PVI	0.01	0.12	0.01
Time Scarcity	-0.01	0.10	-0.02
<b>Step 3</b>			
Extraversion	0.13	0.13	0.12

Conscientiousness	0.24	0.12	0.24
Openness	0.10	0.16	0.08
Neuroticism	0.20	0.13	0.20
Agreeableness	0.09	0.20	0.06
Attentional Control	-0.02	0.14	-0.02
Overall GPA	0.28	0.19	0.16
PVI	0.02	0.12	0.02
Time Scarcity	-0.03	0.10	-0.03
PVI*Time Scarcity	-0.17	0.12	-0.14

*Note.* Step 1  $R^2 = .245$  ( $p < .01$ ), adjusted  $R^2 = .176$ ; Step 2:  $\Delta R^2 = .000$  ( $p > .05$ ), adjusted  $R^2 = .155$ ; Step 3:  $\Delta R^2 = .018$  ( $p > .05$ ), adjusted  $R^2 = .164$ . \* $p < .05$ . \*\* $p < .01$ .

Table 46

*Summary of Hierarchical Regression Analysis for Hypothesis 12b Predicting Time Scarcity Moderates the Polychronicity-Time Management Relationship: MPI (N =85)*

Variable	<i>B</i>	<i>SE B</i>	<i>B</i>
Step 1			
Extraversion	0.15	0.13	0.14
Conscientiousness	0.23	0.12	0.22
Openness	0.16	0.16	0.12
Neuroticism	0.21	0.13	0.20
Agreeableness	0.06	0.19	0.04
Attentional Control	-0.05	0.13	-0.05
Overall GPA	0.32	0.18	0.18
Step 2			
Extraversion	0.15	0.13	0.14
Conscientiousness	0.22	0.12	0.21
Openness	0.15	0.16	0.11
Neuroticism	0.21	0.13	0.20
Agreeableness	0.09	0.21	0.06
Attentional Control	-0.04	0.14	-0.04
Overall GPA	0.32	0.19	0.19
MPI	-0.04	0.10	-0.04
Time Scarcity	-0.01	0.10	-0.02
Step 3			
Extraversion	0.15	0.13	0.14

Conscientiousness	0.23	0.12	0.22
Openness	0.09	0.16	0.07
Neuroticism	0.20	0.13	0.19
Agreeableness	0.10	0.20	0.07
Attentional Control	0.00	0.14	0.00
Overall GPA	0.29	0.19	0.17
MPI	-0.04	0.10	-0.04
Time Scarcity	-0.04	0.10	-0.04
MPI*Time Scarcity	-0.14	0.11	-0.14

*Note.* Step 1  $R^2 = .245$  ( $p < .01$ ), adjusted  $R^2 = .176$ ; Step 2:  $\Delta R^2 = .002$  ( $p > .05$ ), adjusted  $R^2 = .157$ ; Step 3:  $\Delta R^2 = .016$  ( $p > .05$ ), adjusted  $R^2 = .163$ . \* $p < .05$ . \*\* $p < .01$ .

Table 47

*Summary of Hierarchical Regression Analysis for Hypothesis 12c Predicting Time Scarcity Moderates the Polychronicity-Multitasking Relationship: PVI (N = 85)*

Variable	<i>B</i>	<i>SE B</i>	<i>B</i>
<b>Step 1</b>			
Extraversion	0.25	0.15	0.23
Conscientiousness	-0.01	0.14	-0.01
Openness	-0.16	0.18	-0.12
Neuroticism	0.00	0.15	0.00
Agreeableness	0.17	0.21	0.11
Attentional Control	0.02	0.15	0.02
Overall GPA	0.16	0.21	0.09
<b>Step 2</b>			
Extraversion	0.21	0.14	0.19
Conscientiousness	0.07	0.13	0.06
Openness	-0.12	0.17	-0.08
Neuroticism	0.01	0.14	0.01
Agreeableness	-0.08	0.22	-0.05
Attentional Control	-0.04	0.15	-0.04
Overall GPA	0.09	0.20	0.05
PVI	0.35	0.13	0.30**
Time Scarcity	0.25	0.11	0.28*
<b>Step 3</b>			
Extraversion	0.21	0.14	0.19

Conscientiousness	0.07	0.13	0.06
Openness	-0.12	0.18	-0.09
Neuroticism	0.01	0.14	0.01
Agreeableness	-0.07	0.22	-0.05
Attentional Control	-0.04	0.15	-0.04
Overall GPA	0.09	0.20	0.05
PVI	0.35	0.13	0.30**
Time Scarcity	0.25	0.11	0.28*
PVI*Time Scarcity	-0.03	0.13	-0.02

*Note.* Step 1  $R^2 = .077$  ( $p > .05$ ), adjusted  $R^2 = -.007$ ; Step 2:  $\Delta R^2 = .126$  ( $p < .01$ ), adjusted  $R^2 = .107$ ; Step 3:  $\Delta R^2 = .000$  ( $p > .05$ ), adjusted  $R^2 = .095$ . \* $p < .05$ . \*\* $p < .01$ .



Table 48

*Summary of Hierarchical Regression Analysis for Hypothesis 12c Predicting Time Scarcity Moderates the Polychronicity-Multitasking Relationship: MPI (N = 85)*

Variable	<i>B</i>	<i>SE B</i>	<i>B</i>
<b>Step 1</b>			
Extraversion	0.25	0.15	0.23
Conscientiousness	-0.01	0.14	-0.01
Openness	-0.16	0.18	-0.12
Neuroticism	0.00	0.15	0.00
Agreeableness	0.17	0.21	0.11
Attentional Control	0.02	0.15	0.02
Overall GPA	0.16	0.21	0.09
<b>Step 2</b>			
Extraversion	0.24	0.14	0.22
Conscientiousness	0.07	0.13	0.07
Openness	-0.09	0.17	-0.07
Neuroticism	-0.01	0.14	0.00
Agreeableness	-0.08	0.22	-0.05
Attentional Control	-0.03	0.15	-0.03
Overall GPA	0.12	0.20	0.07
MPI	0.24	0.11	0.24*
Time Scarcity	0.23	0.11	0.25*
<b>Step 3</b>			
Extraversion	0.24	0.14	0.22

Conscientiousness	0.07	0.13	0.07
Openness	-0.09	0.18	-0.07
Neuroticism	-0.01	0.14	0.00
Agreeableness	-0.08	0.22	-0.05
Attentional Control	-0.03	0.16	-0.03
Overall GPA	0.12	0.21	0.07
MPI	0.24	0.11	0.24*
Time Scarcity	0.23	0.11	0.25*
MPI*Time Scarcity	0.00	0.12	0.00

*Note.* Step 1  $R^2 = .077$  ( $p > .05$ ), adjusted  $R^2 = -.007$ ; Step 2:  $\Delta R^2 = .101$  ( $p < .05$ ), adjusted  $R^2 = .079$ ; Step 3:  $\Delta R^2 = .000$  ( $p > .05$ ), adjusted  $R^2 = .066$ . \* $p < .05$ . \*\* $p < .01$ .

Table 49

*Summary of Hierarchical Regression Analysis for Hypothesis 12d Predicting Time Scarcity Moderates the Time Urgency-Time Management Relationship (N = 85)*

Variable	<i>B</i>	<i>SE B</i>	<i>B</i>
<b>Step 1</b>			
Extraversion	0.13	0.12	0.13
Conscientiousness	0.21	0.11	0.21
Openness	0.14	0.14	0.10
Neuroticism	0.20	0.12	0.19
Agreeableness	0.09	0.17	0.06
Overall GPA	0.31	0.18	0.18
<b>Step 2</b>			
Extraversion	0.03	0.14	0.03
Conscientiousness	0.10	0.14	0.09
Openness	0.08	0.15	0.06
Neuroticism	0.22	0.13	0.21
Agreeableness	0.10	0.19	0.07
Overall GPA	0.13	0.21	0.08
TU-Competitiveness	0.24	0.21	0.19
TU-Task-related Hurry	0.02	0.12	0.02
TU-General Hurry	0.18	0.15	0.15
Time Scarcity	-0.03	0.11	-0.04
<b>Step 3</b>			
Extraversion	-0.03	0.14	-0.03

Conscientiousness	0.12	0.14	0.12
Openness	0.00	0.16	0.00
Neuroticism	0.26	0.13	0.25*
Agreeableness	0.05	0.19	0.03
Overall GPA	0.07	0.21	0.04
TU-Competitiveness	0.31	0.21	0.23
TU-Task-related Hurry	0.04	0.13	0.04
TU-General Hurry	0.21	0.15	0.17
Time Scarcity	0.00	0.11	0.00
TU-Competitiveness *Time Scarcity	-0.27	0.14	-0.21
TU-Task-related Hurry*Time Scarcity	0.11	0.10	0.13
TU-General Hurry*Time Scarcity	-0.16	0.17	-0.11

*Note.* Step 1  $R^2 = .244$  ( $p < .01$ ), adjusted  $R^2 = .186$ ; Step 2:  $\Delta R^2 = .034$  ( $p > .05$ ), adjusted  $R^2 = -.180$ ; Step 3:  $\Delta R^2 = .077$  ( $p > .05$ ), adjusted  $R^2 = .228$ . \* $p < .05$ . \*\* $p < .01$ .

Table 50

*Multinomial Logistic Regression Analysis for Hypothesis 12e Predicting Time Scarcity Moderates the Time Urgency-Pacing Relationship (N = 85)*

Pacing Behavior		<i>B</i>	<i>SE B</i>	Wald	Sig.	Odds ratio	95% CI
Deadline	Intercept	5.59	7.29	0.59	0.44		
	Extraversion	2.42	1.49	2.65	0.10	11.24	0.61, 206.94
	Conscientiousness	-1.86	0.99	3.51	0.06	0.16	0.02, 1.09
	Openness	1.31	1.26	1.08	0.30	3.70	0.31, 43.79
	Neuroticism	0.13	0.81	0.02	0.88	1.13	0.23, 5.56
	Agreeableness	-1.23	1.24	0.99	0.32	0.29	0.03, 3.31
	Overall GPA	-1.97	1.52	1.69	0.19	0.14	0.01, 2.72
	TU-Competitiveness	0.00	1.43	0.00	1.00	1.00	0.06, 16.62
	TU-Task-related Hurry	0.37	0.87	0.18	0.67	1.45	0.26, 8.06
	TU-General Hurry	0.20	1.04	0.04	0.85	1.22	0.16, 9.34
	TU-Competitiveness*Time Scarcity	1.87	1.16	2.59	0.11	6.48	0.67, 63.11
	TU-Task-related Hurry*Time Scarcity	-0.22	0.73	0.09	0.77	0.81	0.19, 3.37
	TU-General Hurry*Time Scarcity	-2.65	1.35	3.82	0.05	0.07	0.00, 1.01
	Steady	Intercept	-8.96	8.75	1.05	0.31	

	Extraversion	2.75	1.63	2.85	0.09	15.58	0.64, 377.99
	Conscientiousness	-1.72	1.23	1.95	0.16	0.18	0.02, 2.01
	Openness	1.62	1.42	1.29	0.26	5.03	0.31, 81.56
	Neuroticism	-1.17	1.02	1.33	0.25	0.31	0.04, 2.27
	Agreeableness	-1.05	1.36	0.59	0.44	0.35	0.02, 5.08
	Overall GPA	-1.61	1.75	0.85	0.36	0.20	0.01, 6.18
	TU-Competitiveness	2.59	1.91	1.84	0.18	13.36	0.32, 566.30
	TU-Task-related Hurry	-1.32	1.10	1.43	0.23	0.27	0.03, 2.32
	TU-General Hurry	2.99	1.37	4.73	0.03	19.81	1.34, 291.77
	TU-Competitiveness*Time Scarcity	1.36	1.27	1.15	0.28	3.90	0.32, 47.17
	TU-Task-related Hurry*Time Scarcity	-0.19	0.75	0.06	0.80	0.83	0.19, 3.61
	TU-General Hurry*Time Scarcity	-0.29	1.43	0.04	0.84	0.75	0.05, 12.34
Curvilinear	Intercept	-9.35	7.12	1.72	0.19		
	Extraversion	3.12	1.47	4.49	0.03	22.57	1.27, 402.74
	Conscientiousness	-2.13	1.02	4.37	0.04	0.12	0.02, 0.88
	Openness	1.97	1.27	2.42	0.12	7.16	0.6, 85.62
	Neuroticism	-0.26	0.82	0.10	0.75	0.77	0.16, 3.84
	Agreeableness	0.07	1.21	0.00	0.96	1.07	0.10, 11.46
	Overall GPA	-1.48	1.51	0.96	0.33	0.23	0.01, 4.37
	TU-Competitiveness	0.58	1.41	0.17	0.68	1.79	0.11, 28.19
	TU-Task-related Hurry	0.28	0.83	0.11	0.74	1.32	0.26, 6.70
	TU-General Hurry	1.43	1.01	2.00	0.16	4.18	0.58, 30.37

TU-Competitiveness*Time Scarcity	2.02	1.12	3.24	0.07	7.55	0.84, 68.14
TU-Task-related Hurry*Time Scarcity	0.09	0.68	0.02	0.89	1.10	0.29, 4.19
TU-General Hurry*Time Scarcity	-1.19	1.28	0.88	0.35	0.30	0.02, 3.69

*Note.* These data are compared to a referent group of Early Action Pacing behavior. CI = confidence interval. TU = Time Urgency. Nagelkerke  $R^2 = .619$ .

Table 51

*Summary of Hierarchical Regression Analysis for Hypothesis 12f Predicting Time**Scarcity Moderates the Time Urgency-Multitasking Relationship (N = 85)*

Variable	<i>B</i>	<i>SE B</i>	<i>B</i>
Step 1			
Extraversion	0.25	0.15	0.23
Conscientiousness	-0.01	0.14	-0.01
Openness	-0.16	0.18	-0.12
Neuroticism	0.00	0.15	0.00
Agreeableness	0.17	0.21	0.11
Attentional Control	0.02	0.15	0.02
Overall GPA	0.16	0.21	0.09
Step 2			
Extraversion	0.29	0.17	0.26
Conscientiousness	0.10	0.16	0.10
Openness	-0.13	0.18	-0.09
Neuroticism	-0.04	0.15	-0.03
Agreeableness	-0.02	0.23	-0.01
Attentional Control	0.10	0.16	0.10
Overall GPA	0.20	0.24	0.11
TU-Competitiveness	-0.03	0.24	-0.02
TU-Task-related Hurry	-0.01	0.14	-0.01
TU-General Hurry	-0.25	0.17	-0.20
Time Scarcity	0.23	0.12	0.26
Step 3			



Extraversion	0.27	0.17	0.24
Conscientiousness	0.06	0.17	0.06
Openness	-0.18	0.20	-0.13
Neuroticism	-0.05	0.16	-0.05
Agreeableness	-0.01	0.24	-0.01
Attentional Control	0.12	0.17	0.11
Overall GPA	0.14	0.25	0.08
TU-Competitiveness	0.02	0.25	0.01
TU-Task-related Hurry	0.00	0.15	0.00
TU-General Hurry	-0.20	0.18	-0.16
Time Scarcity	0.26	0.13	0.29*
TU-Competitiveness *Time Scarcity	0.05	0.17	0.04
TU-Task-related Hurry*Time Scarcity	0.12	0.12	0.13
TU-General Hurry*Time Scarcity	-0.16	0.20	-0.10

*Note.* Step 1  $R^2 = .077$  ( $p > .05$ ), adjusted  $R^2 = -.007$ ; Step 2:  $\Delta R^2 = .077$  ( $p > .05$ ), adjusted  $R^2 = -.027$ ; Step 3:  $\Delta R^2 = .017$  ( $p > .05$ ), adjusted  $R^2 = .006$ . \* $p < .05$ . \*\* $p < .01$ .

Table 52

*Summary of Hierarchical Regression Analysis for Hypothesis 13 Predicting Instructor-rated Performance from Time Management (N = 85)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Step 1			
Instructor	0.40	0.64	0.06
Overall GPA	12.34	2.54	0.47**
Step 2			
Instructor	0.39	0.65	0.06
Overall GPA	12.26	2.61	0.47**
Time Management	0.24	1.51	0.02

*Note.* Step 1  $R^2 = .225$  ( $p < .05$ ), adjusted  $R^2 = .206$ ; Step 2:  $\Delta R^2 = .000$  ( $p > .05$ ), adjusted  $R^2 = .196$ . \* $p < .05$ . \*\* $p < .01$ .

Table 53

*Summary of Hierarchical Regression Analysis for Hypothesis 13 Predicting Self-rated Performance from Time Management (N = 84)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Step 1			
Instructor	0.04	0.03	0.13
Overall GPA	-0.50	0.13	-0.39**
Step 2			
Instructor	0.04	0.03	0.13
Overall GPA	-0.48	0.14	-0.37**
Time Management	-0.06	0.08	-0.08

*Note.* Step 1  $R^2 = .169$  ( $p < .05$ ), adjusted  $R^2 = .148$ ; Step 2:  $\Delta R^2 = .007$  ( $p > .05$ ), adjusted  $R^2 = .145$ . \* $p < .05$ . \*\* $p < .01$ .

Table 54

*Summary of Hierarchical Regression Analysis for Hypothesis 14 Predicting Instructor-rated Performance from Pacing Behavior (N = 91)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Step 1			
Instructor	-0.53	0.90	-0.05
Overall GPA	18.34	3.26	0.51**
Step 2			
Instructor	-0.63	0.94	-0.06
Overall GPA	18.70	3.36	0.52**
Steady Pacing	-0.35	3.69	-0.01
Curvilinear Pacing	-0.32	2.77	-0.01
Deadline Pacing	2.32	3.10	0.07

*Note.* Step 1  $R^2 = .272$  ( $p > .05$ ), adjusted  $R^2 = .256$ ; Step 2:  $\Delta R^2 = .005$  ( $p > .05$ ), adjusted  $R^2 = .235$ . \* $p < .05$ . \*\* $p < .01$ .

Table 55

*Summary of Hierarchical Regression Analysis for Hypothesis 14 Predicting Self-rated Performance from Pacing Behavior (N = 84)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Step 1			
Instructor	0.04	0.03	0.13
Overall GPA	-0.50	0.13	-0.39**
Step 2			
Instructor	0.03	0.03	0.08
Overall GPA	-0.44	0.13	-0.34**
Steady Pacing	-0.22	0.13	-0.19
Curvilinear Pacing	0.03	0.10	0.03
Deadline Pacing	0.19	0.11	0.18

*Note.* Step 1  $R^2 = .169$  ( $p < .05$ ), adjusted  $R^2 = .148$ ; Step 2:  $\Delta R^2 = .045$  ( $p > .05$ ), adjusted  $R^2 = .163$ . \* $p < .05$ . \*\* $p < .01$ .

Table 56

*Summary of Hierarchical Regression Analysis for Hypothesis 15 Predicting Instructor-rated Performance from Multitasking (N = 88)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Step 1			
Instructor	0.33	0.64	0.05
Attentional Control	-1.51	1.48	-0.10
Overall GPA	12.87	2.46	0.51**
Step 2			
Instructor	0.51	0.65	0.08
Attentional Control	-1.35	1.49	-0.09
Overall GPA	12.93	2.46	0.51**
Multitasking	-1.68	1.43	-0.12

*Note.* Step 1  $R^2 = .248$  ( $p < .01$ ), adjusted  $R^2 = .221$ ; Step 2:  $\Delta R^2 = .012$  ( $p > .05$ ), adjusted  $R^2 = .224$ . \* $p < .05$ . \*\* $p < .01$ .

Table 57

*Summary of Hierarchical Regression Analysis for Hypothesis 15 Predicting Self-rated Performance from Multitasking (N = 84)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Step 1			
Instructor	0.04	0.03	0.13
Attentional Control	0.00	0.08	0.01
Overall GPA	-0.50	0.14	-0.39**
Step 2			
Instructor	0.04	0.03	0.11
Attentional Control	0.00	0.08	0.00
Overall GPA	-0.51	0.14	-0.39**
Multitasking	0.05	0.08	0.07

*Note.* Step 1  $R^2 = .169$  ( $p < .01$ ), adjusted  $R^2 = .138$ ; Step 2:  $\Delta R^2 = .004$  ( $p > .05$ ), adjusted  $R^2 = .131$ . \* $p < .05$ . \*\* $p < .01$ .

Table 58

*Factor Loadings for 18 Time-Related Individual Difference Items*

	Factor				
	Task-related	Poly	Comp	Present	Future
I am usually pressed for time	-0.861				
I often feel very pressed for time	-0.830				
I am often in a hurry	-0.692				
I complete projects on time by making steady progress	0.559				
I am slow doing things	0.389				
I would prefer to work in an environment where I can finish one task before starting the next		-0.936			
I would rather switch back and forth between several projects than concentrate my efforts on just one		-0.887			
I prefer to do one thing at a time		-0.806			
I am ambitious			0.804		
I am hard driving			0.741		
I am hard driving and competitive			0.679		



Taking risks keeps my life from becoming boring	0.801
I take risks to put excitement in my life	0.793
It is important to put excitement in my life	0.557
I often work slowly and leisurely	0.717
My spouse or a close friend would rate me as definitely relaxed and easy going	0.588
When I want to achieve something, I set goals and consider specific means for reaching those goals	0.548
Meeting tomorrows deadlines and doing other necessary work comes before tonight's play	0.463

---

*Note.* Task-related = Task-related hurry. Poly = Polychronicity. Comp = Competitiveness. Present = Present time perspective. Future = Future time perspective.

Table 59

*Summary of Multiple Regression Analysis for Predicting Time Management from New Time-related Individual Difference Scales (N = 87)*

Variable	<i>B</i>	<i>SE B</i>	<i>B</i>
Intercept	.81	.86	
Present Time Perspective	-.06	.11	-.06
Future Time Perspective	.41	.13	.36**
Polychronicity	.02	.09	.02
Time Urgency – Task-related hurry	-.09	.19	-.05
Time Urgency – Competitiveness	.27	.12	.25*

*Note.*  $R^2 = .241$  ( $p < .01$ ), adjusted  $R^2 = .194$ . \* $p < .05$ . \*\* $p < .01$ .

Table 60

*Summary of Multiple Regression Analysis for Predicting Multitasking from New Time-related Individual Difference Scales (N = 90)*

Variable	<i>B</i>	<i>SE B</i>	<i>B</i>
Intercept	1.89	.96	
Present Time Perspective	-.05	.12	-.05
Future Time Perspective	-.15	.14	-.13
Polychronicity	.24	.10	.26*
Time Urgency – Task-related hurry	.10	.21	.05
Time Urgency – Competitiveness	.14	.13	.13

*Note.*  $R^2 = .306$  ( $p > .05$ ), adjusted  $R^2 = .040$ . \* $p < .05$ . \*\* $p < .01$ .

Table 61

*Multinomial Logistic Regression for Predicting Pacing from New Time-related Individual Difference Scales (N = 87)*

Pacing Behavior		B	SE B	Wald	Sig.	Odds ratio	95% CI
Deadline	Intercept	3.56	4.86	0.54	0.46		
	Present Time Perspective	0.34	0.57	0.35	0.56	1.40	0.46, 4.31
	Future Time Perspective	0.24	0.74	0.11	0.75	1.27	0.30, 5.38
	Polychronicity	-1.58	0.60	6.84	0.01	0.21	0.06, 0.67
	TU – Task-related hurry	-0.52	1.10	0.23	0.64	0.59	0.07, 5.13
	TU – Competitiveness	0.61	0.65	0.88	0.35	1.84	0.51, 6.64
Steady	Intercept	-1.85	5.45	0.12	0.73		
	Present Time Perspective	-0.03	0.68	0.00	0.96	0.97	0.26, 3.64
	Future Time Perspective	0.56	0.83	0.44	0.51	1.74	0.34, 8.93
	Polychronicity	-0.97	0.64	2.32	0.13	0.38	0.11, 1.32
	TU – Task-related hurry	-1.19	1.19	1.00	0.32	0.31	0.03, 3.13
	TU – Competitiveness	2.07	0.83	6.27	0.01	7.94	1.57, 40.21
Curvilinear	Intercept	-5.26	5.00	1.11	0.29		
	Present Time Perspective	1.05	0.60	3.09	0.08	2.86	0.89, 9.25
	Future Time Perspective	1.05	0.76	1.92	0.17	2.85	0.65, 12.55
	Polychronicity	-1.27	0.59	4.59	0.03	0.28	0.09, 0.90
	TU – Task-related hurry	-0.48	1.07	0.20	0.65	0.62	0.08, 5.07
	TU – Competitiveness	1.42	0.70	4.13	0.04	4.14	1.05, 16.31

*Note.* These data are compared to a referent group of Early Action Pacing behavior. CI = confidence interval. TU = Time Urgency. Nagelkerke  $R^2 = .342$ .

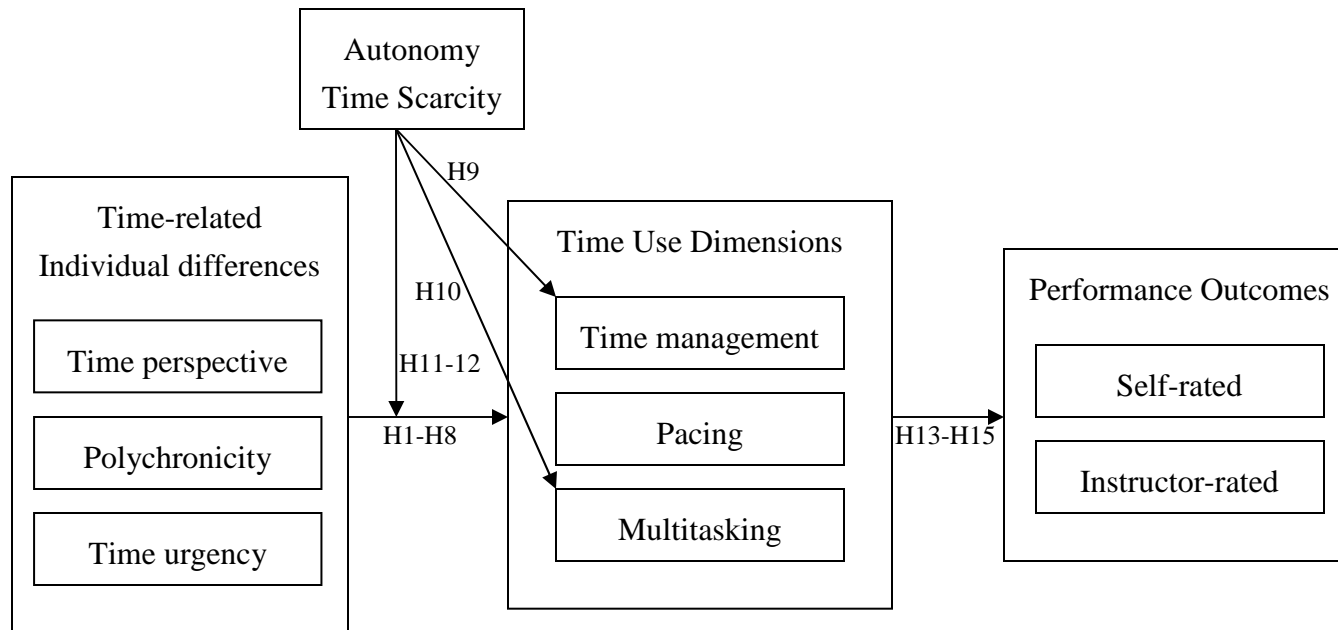


Figure 1. Proposed Model Linking Time-related Individual Differences to Time Use Dimensions and Performance Outcomes.

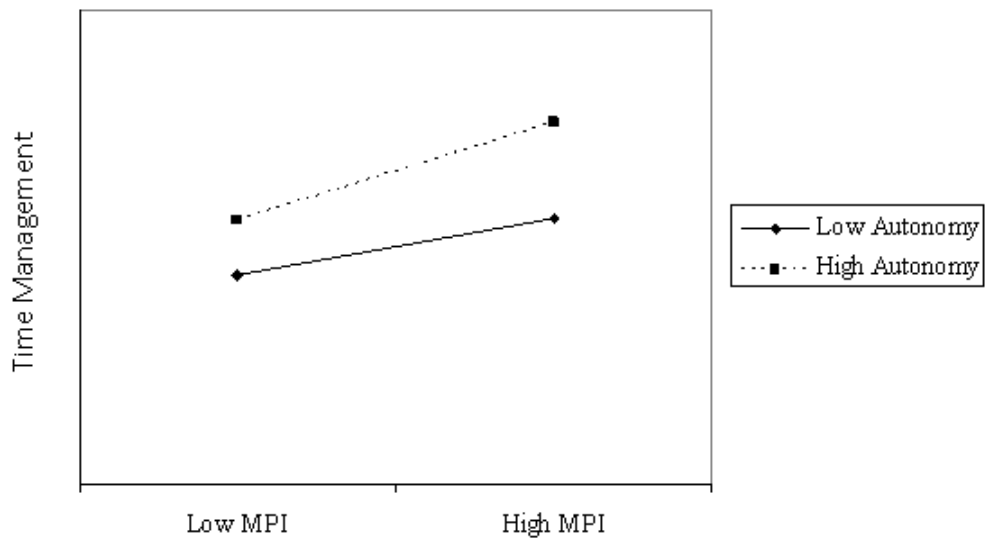
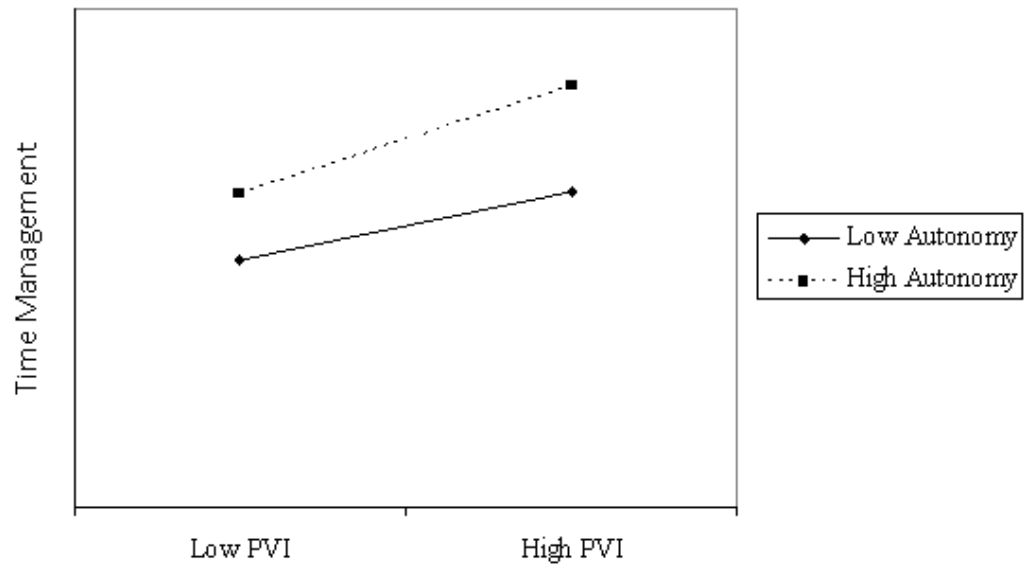


Figure 2. Interaction between polychronicity and autonomy on time management behaviors.

## Appendix A: Study Measures

### Time Perspective: Time Perspective Inventory (ZTPI) Zimbardo and Boyd, 1999

Read each item and, as honestly as you can, answer the question: “How characteristic or true is this of you?”

1	2	3	4	5
Very Untrue		Neutral		Very True

1. I believe that getting together with one's friends to party is one of life's important pleasures.
2. Fate determines much in my life.
3. I believe that a person's day should be planned ahead each morning.
4. I do things impulsively.
5. If things don't get done on time, I don't worry about it. (R)
6. When I want to achieve something, I set goals and consider specific means for reaching those goals.
7. When listening to my favorite music, I often lose all track of time.
8. Meeting tomorrow's deadlines and doing other necessary work comes before tonight's play.
9. Since whatever will be will be, it doesn't really matter what I do.
10. I try to live my life as fully as possible, one day at a time.
11. It upsets me to be late for appointments.
12. Ideally, I would live each day as if it were my last.
13. I meet my obligations to friends and authorities on time.
14. I make decisions on the spur of the moment.
15. I take each day as it is rather than try to plan it out. (R)
16. It is important to put excitement in my life.
17. I feel that it's more important to enjoy what you're doing than to get work done on time.
18. Before making a decision, I weigh the costs against the benefits.
19. Taking risks keeps my life from becoming boring.
20. It is more important for me to enjoy life's journey than to focus only on the destination.
21. It takes joy out of the process and flow of my activities, if I have to think about goals, outcomes, and products.
22. You can't really plan for the future because things change so much.

23. My life path is controlled by forces I cannot influence.
24. It doesn't make sense to worry about the future, since there is nothing that I can do about it anyway.
25. I complete projects on time by making steady progress.
26. I take risks to put excitement in my life.
27. I make lists of things to do.
28. I often follow my heart more than my head.
29. I am able to resist temptations when I know that there is work to be done.
30. I find myself getting swept up in the excitement of the moment.
31. Life today is too complicated; I would prefer the simpler life of the past.
32. I prefer friends who are spontaneous rather than predictable.
33. I keep working at difficult, uninteresting tasks if they will help me get ahead.
34. Spending what I earn on pleasures today is better than saving for tomorrow's security.
35. Often luck pays off better than hard work.
36. I like my close relationships to be passionate.
37. There will always be time to catch up on my work. (R)

Present time perspective: 1, 2, 4, 7, 9, 10, 12, 14, 16, 17, 19, 20, 21, 22, 23, 24, 26, 28, 30, 31, 32, 34, 35, 36

Future time perspective: 3, 5, 6, 8, 11, 13, 15, 18, 25, 27, 29, 33, 37



Multitasking Preference Inventory  
Poposki and Oswald (2010)

- | 1                    | 2        | 3       | 4     | 5                 |
|----------------------|----------|---------|-------|-------------------|
| Strongly<br>Disagree | Disagree | Neutral | Agree | Strongly<br>Agree |
1. I prefer to work on several projects in a day, rather than completing one project and then switching to another.
  2. I would like to work in a job where I was constantly shifting from one task to another, like a receptionist or an air traffic controller.
  3. I lose interest in what I am doing if I have to focus on the same task for long periods of time, without thinking about or doing something else.
  4. When doing a number of assignments, I like to switch back and forth between them rather than do one at a time.
  5. I like to finish one task completely before focusing on anything else. (R)
  6. It makes me uncomfortable when I am not able to finish one task completely before focusing on another task. (R)
  7. I am much more engaged in what I am doing if I am able to switch between several different tasks.
  8. I do not like having to shift my attention between multiple tasks. (R)
  9. I would rather switch back and forth between several projects than concentrate my efforts on just one.
  10. I would prefer to work in an environment where I can finish one task before starting the next. (R)
  11. I don't like when I have to stop in the middle of a task to work on something else. (R)
  12. When I have a task to complete, I like to break it up by switching to other tasks intermittently.
  13. I have a "one-track" mind. (R)
  14. I prefer not to be interrupted when working on a task. (R)

Polychronic Values Inventory (PVI)  
Bluedorn, Kalliath, Strube, and Martin (1999)

1	2	3	4	5
Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

1. I like to juggle several activities at the same time.
2. I would rather complete an entire project every day than complete part of several projects (R).
3. I believe people should try to do many things at once.
4. When I work by myself, I usually work on one project at a time (R).
5. I prefer to do one thing at a time (R).
6. I believe people do their best work when they have many tasks to complete.
7. I believe it is best to complete one task before beginning another (R).
8. I believe it is best for people to be given several tasks and assignments to perform.
9. I seldom like to work on more than a single task or assignment at the same time (R)
10. I would rather complete parts of several projects every day than complete an entire project.

Time Urgency Likert Items  
Landy, Rastegary, Thayer, and Colvin (1991)

Please use the scale below to decide how well each statement describes your behavior using the response scale below.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

1. I am slow doing things. (R)
2. I often feel very pressed for time.
3. I like work that is slow and deliberate. (R)
4. I go "all out."
5. I have a strong need to excel in most things.
6. I am usually pressed for time.
7. I am hard driving.
8. I often work slowly and leisurely. (R)
9. I set deadlines or quotas for myself at work and other things.
10. I am hard driving and competitive.
11. I am ambitious.
12. My spouse or a close friend would rate me as definitely relaxed and easy going. (R)
13. I usually work fast.
14. I am often in a hurry.

Competitiveness: 4, 5, 7, 9, 10, 11

Task-Related Hurry: 2, 6, 14

General Hurry: 1, 3, 8, 12, 13

Mini-Marker Set  
Saucier (1994)

Please use this list of common human traits to describe yourself as accurately as possible. Describe yourself as you see yourself at the present time, not as you wish to be in the future. Describe yourself as you are generally or typically, as compared with other persons you know of the same sex and of roughly your same age.

1	2	3	4	5
Very inaccurate	Inaccurate	Neither accurate nor inaccurate	Accurate	Very accurate

1. Bashful (R)
2. Bold
3. Careless (R)
4. Cold (R)
5. Complex
6. Cooperative
7. Creative
8. Deep
9. Disorganized (R)
10. Efficient
11. Energetic
12. Envious (R)
13. Extraverted
14. Fretful (R)
15. Harsh (R)
16. Imaginative
17. Inefficient (R)
18. Intellectual
19. Jealous (R)
20. Kind
21. Moody (R)
22. Organized
23. Philosophical
24. Practical
25. Quiet (R)
26. Relaxed
27. Rude (R)
28. Shy (R)
29. Sloppy (R)
30. Sympathetic
31. Systematic

- 32. Talkative
- 33. Temperamental (R)
- 34. Touchy (R)
- 35. Uncreative (R)
- 36. Unenvious
- 37. Unintellectual (R)
- 38. Unsympathetic (R)
- 39. Warm
- 40. Withdrawn (R)

Extraversion: 1, 2, 11, 13, 25, 28, 32, 40  
Agreeableness: 4, 6, 15, 20, 27, 30, 38, 39,  
Conscientiousness: 3, 9, 10, 17, 22, 24, 29, 31,  
Emotional Stability: 12, 14, 19, 21, 26, 33, 34, 36  
Intellect/Openness: 5, 7, 8, 16, 18, 23, 35, 37

Scheduling Subscale of Work Autonomy Scales  
Breugh (1989)

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

1. I have control over the schedule of my work.
2. I have some control over the sequencing of my work activities (when I do what).
3. My job is such that I can decide when to do particular work activities.

Adult Temperament Questionnaire  
Rothbart, Ahadi, and Evans (2000)

1	2	3	4	5
Very inaccurate	Inaccurate	Neither accurate nor inaccurate	Accurate	Very accurate

1. When I am trying to focus my attention, I am easily distracted (R).
2. When interrupted or distracted, I usually can easily shift my attention back to whatever I was doing before.
3. When trying to focus my attention on something, I have difficulty blocking out distracting thoughts (R).
4. I am usually pretty good at keeping track of several things that are happening around me.
5. When trying to study something, I have difficulty tuning out background noise and concentrating (R).
6. It's often hard for me to alternate between two different tasks (R).

## Detailed Proposal Guidelines

The proposals must include the following:

1. An Introduction section that states the main area of the proposed research and then includes a review of the relevant literature that is directly related to the proposed research plan. It should also state the research question of interest and then state the hypothesis, usually at the end of the introduction.
2. A Method section that includes a Design section (e.g., a 2 X 2 mixed factorial), Participants section, Materials section and Procedure section. All of the sections should be written in appropriate APA format.
3. An Analysis Plan section should briefly describe how the data would be analyzed and what the expected result might be based on the hypothesis. For example, if a correlational study is done, the student would write something such as “A Pearson-product correlational analysis will be conducted to determine the strength and direction of the correlation between anxiety and depression. It is expected that the correlation between these variables would be..... because.....” This part should have only a few sentences.
  - Students should not be asked to “make up” findings, but should mention the likely findings/direction of the outcome based on previous findings.
4. A Conclusion section (based on potential/possible outcomes) should include the following:
  - a. What would this research contribute to the literature if the hypothesis were supported?
  - b. A discussion of what would be done next if the hypothesis were supported. In other words, what would be the next step in the research or what would the researcher do next.
  - c. Additional ideas if the hypothesis were not supported could be added. Of course, this would be hypothetical.
  - d. Limitations of the study.
  - e. This should be only a paragraph or two at most.
5. An Abstract should be included as well. Students will include an expected outcome rather than a real outcome. Again the text should be written in the future tense. For example, “It is expected that older adults would recall fewer words than younger adults.”  
(Note: This section should be only one or two paragraphs and does not have to be extensive.)

All students must attach the measures/materials to be used (e.g., a survey). An exception will be made if the survey would have to be purchased by the student. However, this is a rare exception.



## Time Diary

Instructions: The following questions ask you about progress on your Research Methods 301 Research Proposal **since your last lab**.

Code name: (This name will be used ONLY to match your responses to the other parts of your survey)

Code Name 1 = Name of the street you grew up on: \_\_\_\_\_

Code Name 2 = Your best friend's first name: \_\_\_\_\_

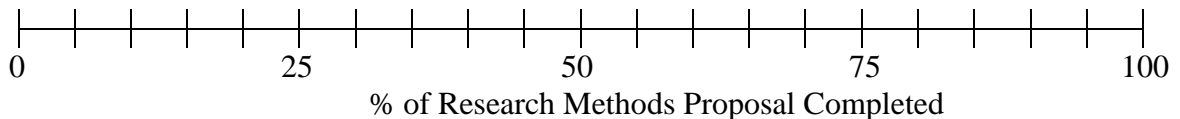
**1) Which days did you work on your Research Methods 301 Research Proposal since your last lab?**

None	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday

**2) While I worked on my Research Methods 301 Research Proposal since my last lab,**

	Never	Occasionally	Sometimes	Often	Always
I was occupied with several things simultaneously.	1	2	3	4	5
I worked on more than one task.	1	2	3	4	5
I worked on tasks in a sequential manner.	1	2	3	4	5
I accomplished several tasks simultaneously.	1	2	3	4	5
My focus was divided between two or more tasks.	1	2	3	4	5
Switching among tasks made it difficult to concentrate on any of them.	1	2	3	4	5

3) As of **today**, what percent of your Research Methods 301 Research Proposal has been completed? Please mark a line on the graph below.



4) Please rate the amount of progress you made regarding your Research Methods 301 Research Proposal **since your last lab**.

Much less than I expected

Less than I expected

About what I expected

More than I expected

Much more than I expected

5) If you made less progress on your Research Methods 301 Research Proposal than you expected **since your last lab**, what prevented you from accomplishing your plans (e.g., unexpectedly needed to pick a friend up, procrastinated/avoided working on proposal by doing other things)? Please use the back of this sheet to respond.

Multitasking  
König, Oberacher, & Kleinmann (2010)

1	2	3	4	5
Never	Occasionally	Sometimes	Often	Always

During the time I worked on my Research Methods 301 Research Proposal since my last lab:

1. I was occupied with several things simultaneously.
2. I worked on more than one task.
3. I worked on tasks in a sequential manner.
4. I accomplished several tasks simultaneously.
- \*5. My focus was divided between two or more tasks.
- \*6. Switching among tasks made it difficult to concentrate on any of them (R).

\*Items 5 and 6 were created for this study.

Time Management Behavior Scale (TMB; modified)  
Macan, Shahani, Dipboye, & Phillips (1990)  
(Copyrighted, received permission to use)

Please think about how you worked on your goals **during the course of this study**. To what extent does each of the statements accurately describe your recent activities and experiences? Please use the following scale in responding to these statements.

1	2	3	4	5
Seldom True	Occasionally True	True about as often as not	Frequently True	Very Often True

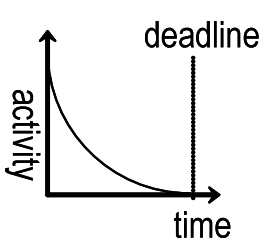
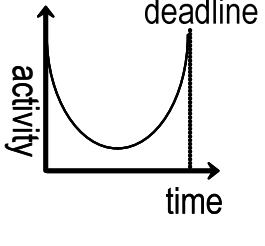
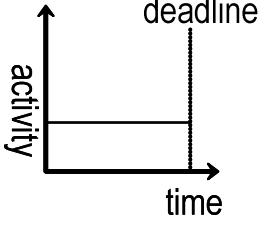
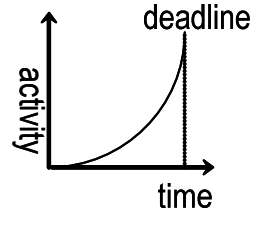
Setting Goals and Priorities

1. When I decided on what I would try to accomplish in the short term, I kept in mind my long-term objectives.
2. I reviewed my goals to determine if they needed revising.
3. I broke complex, difficult projects down into smaller manageable tasks.
4. I set short-term goals for what I wanted to accomplish in the coming days or weeks.
5. I set deadlines for myself when I set out to accomplish a task.
6. I looked for ways to increase the efficiency with which I performed my work activities.
7. I finished top priority tasks before going on to less important ones.
8. I reviewed my daily activities to see where I was wasting time.
9. During the workday, I evaluated how well I was following the schedule I had set down for myself.
10. I set priorities to determine the order in which I would perform tasks each day.

Mechanics of Time Management

11. I carried a notebook to jot down notes and ideas.
12. I scheduled activities at least a week in advance.
13. I blocked out time in my daily schedule for regularly scheduled events.
14. I wrote notes to remind myself of what I needed to do.
15. I made a list of things to do each day and checked off each task as it was accomplished.
16. I carried an appointment book with me.
17. I kept a daily log of my activities.
18. I found places to work that would allow me to avoid interruptions and distractions.
19. If I knew I would have to spend time waiting, I brought along something I could work on.

Modified Pacing Scales II  
Gevers, Claessens, Van Eerde, and Rutte (2009)

 <p>I started right away and finish the work long before the deadline.</p>	 <p>I did most of the work at the beginning and at the end, and slowed down in between.</p>	 <p>I worked steadily on the task, spreading it out evenly over time.</p>	 <p>I did most of the work in a relatively short time before the deadline.</p>
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Time Supply Scale (TSS)  
Kaufman & Lane (1997)

Please think about how you worked on your goals **during the course of this study**. To what extent does each of the statements accurately describe your recent activities and experiences? Please use the following scale in responding to these statements.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

1. I have had to do things which I didn't really have the time and energy for.
2. There were too many demands on my time.
3. I needed more hours in the day to do all the things which were expected of me.
4. I couldn't ever seem to get caught up.
5. I didn't ever seem to have any time for myself.
6. Sometimes I felt as if there were not enough hours in the day.

## Appendix B: Detailed Preliminary Analyses

**Time Perspective.** Coefficient alphas for the Time Perspective Inventory dimension alphas were as follows: .88<sup>12</sup> for the 24 present-orientation items and .78 for the 13 future perspective items. An initial EFA suggested a two-factor solution with Eigenvalues of 8.55 and 3.33 accounting for 32.11% of the variance. Corrected item-total correlations revealed that a handful of the present perspective items were not functioning as expected (values below .3). Furthermore, an additional group of items primarily from the present perspective factor had poor loadings, or were negatively loaded on the wrong factor. Six other items were excluded from the present perspective factor, and one from the future perspective factor was removed and a second EFA was run. Eigenvalues were 6.25 and 2.65 accounting for 35.58% of the variance for the final set of items. Revised coefficient alphas were calculated as follows: present (.86; 14 items), and future (.75; 12 items). While these alphas were slightly lower, they were comparable to reported alphas, and furthermore, the retained items loaded positively on the correct factor (see Table 11). Test-retest reliability for the present dimension was .77 and for the future dimension, .64<sup>13</sup>.

**Polychronicity.** Coefficient alpha for the PVI was .91. As a check, an EFA was run, resulting in an Eigenvalue of 5.54 and 55.38% of variance accounted for by a single-factor solution in which all of the items demonstrated sufficient loadings above .4. Test-retest reliability was .60.

Coefficient alpha for the MPI was .93. Inspection of the corrected item-total correlations, inter-item correlations, alpha after these items were deleted, and EFA factor loadings suggested that 3 items be removed. The original EFA resulted in Eigenvalues of 7.48 and 1.23, accounting for 62.25 % of the variance in scores. Using the reduced 11-item scale,  $\alpha = .94$ , and this single factor (Eigenvalue of 7.06) accounted for 64.15% of the variance. Test-retest reliability was .50. The correlation between the MPI and PVI scales was .86.

**Time Urgency.** Coefficient alphas for the time urgency dimensions were as follows: competitiveness = .75 (6 items), task-related hurry = .85 (3 items), and general hurry = .63 (5 items). An EFA revealed that the items grouped together as expected, with 13 of the 14 items loading positively above .4 on the correct factors. Three factors were

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<sup>12</sup> Note that I collapsed across the present-hedonic and present-fatalistic dimensions, as the majority of the literature on time perspective distinguishes only between present and future. An EFA supported a two factor solution as well. Coefficient alphas for the two separate dimensions were .85 (present-hedonic) and .76 (present-fatalistic),  $r = .54$ .

<sup>13</sup> The test-retest interval ranged from 40-67 days ( $M = 57.49$ ,  $SD = 7.88$ ).

obtained with Eigenvalues of 3.48, 2.69, and 1.71, accounting for 56.24% of the variance in scores. The exception was “I set deadlines or quotas for myself at work and other things” in the competitiveness dimension, which had a loading near .4 (.35). As such, this item was retained for inclusion in the competitiveness dimension score. As expected, a 3-factor solution was produced with Eigenvalues of 3.48, 2.69, and 1.71, accounting for 56.24% of the variance. Table 12 shows the factor loadings for all three dimensions. Test-retest reliability was .81 for competitiveness, .68 for task-related hurry, and .73 for general hurry.

**Personality.** Coefficient alphas for personality dimensions were as follows: .88 (extraversion), .77 (agreeableness), .86 (conscientiousness), .73 (neuroticism), and .68 (openness). Item-total correlations and the alpha if item deleted suggested that 6 items did not function well: Complex, Philosophical, Practical, Relaxed, Touchy, and Unsympathetic. An EFA resulted in Eigenvalues of 7.23, 4.08, 3.47, 2.82, and 2.23, accounting for 50.82% of the variance in scores. The EFA supported the removal of these items, and two additional items loaded poorly and on the wrong factors (Deep and Rude). These modifications left each of the traits with at least 5 items loading most strongly on the factors uncovered by Saucier (1994). Revised trait alphas were calculated and resulted in the following: .88 (extraversion; 8 items), .79 (agreeableness; 6 items), .88 (conscientiousness; 7 items), .78 (neuroticism; 6 items), and .77 (openness; 5 items). This analysis produced Eigenvalues of 7.37, 3.81, 3.27, 2.23, and 1.96, accounting for 58.26% of the variance in scores. Table 13 shows the revised factor loadings. Test-retest reliability for the revised scales was .89 (extraversion), .87 (conscientiousness), .85 (openness), .76 (neuroticism), and .80 (agreeableness).

**Time Management.** Overall coefficient alpha for the 19 item scale was .90. Dimension alphas were .82 for setting goals and priorities (10 items), and .83 for the mechanics dimension (9 items). Two items showed low corrected item-total correlations: “I finished top priority tasks before going on to less important ones” and “I found places to work that would allow me to avoid interruptions and distractions”. These two items were excluded before running an EFA. Eigenvalues were 6.90 and 1.55 (adding an additional 8.17% variance) for a total of 44.47% of the variance accounted for. Factor loadings from this analysis are shown in Table 14 and are sorted by dimension. Clearly, items did not show acceptable positive loading with their respective dimensions. In fact, many are negative. Closer inspection revealed a one-factor solution may have been more appropriate, as it still accounted for nearly as much of the variance (40.61%), with an Eigenvalue of 6.90. Factor loadings here were all positive, ranging from .51 to .71. As such, a decision was made to examine Time Management as a single dimension (see Table 15). After having removed the two poorly functioning items, coefficient alpha for the scale was .91.

**Multitasking.** Several steps were taken to decide whether it was meaningful to average the multitasking scores for each week together to arrive at a single multitasking score for each person. Coefficient alphas were first explored for each set of items for each of 5 weeks<sup>14</sup>. The alphas for the five weeks ranged from .77 to .90 with an average alpha

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<sup>14</sup> Note that while the objective was to observe students’ behaviors for four weeks leading up to the



of .88 across all 5 weeks. Next, inter-item correlations and corrected item-total correlations were examined. A pattern appeared such that all of the items were acceptably related with the exception of the associations with the item, “I worked on tasks in a sequential manner”. Moreover, in four of five weeks, this item showed a low corrected item-total correlation, (ranging from .02 to .15). I suspect that students had difficulty with the meaning of this item, as several students inquired about it weeks into the study. At this point, coefficient alphas were explored excluding this item. Alphas increased to .91, .84, .85, .87, and .89 (for weeks 1-5, respectively), and an average alpha of .87. A decision was made to remove item 3. Scales were then treated as “items”, and a coefficient alpha was examined for all five “items” (i.e., time points). Here, the resulting alpha was .87. For the primary four time points, correlations among the “items” ranged from .53 to .87. Furthermore, the alpha if item (scale) deleted for the four primary measurements did not increase the overall scale coefficient alpha. An intraclass correlation (ICC) was also examined, which is a measure of the proportion of variance that can be attributed to objects of measurement – here, participants, to total variance. ICC(1), to assess test-retest reliability of a single rater, was used (McGraw & Wong, 1996). The ICC was .88, with a 95% confidence interval from .72 to .96. As an additional check, EFAs were examined for all five weeks. As expected, all of the items loaded onto a single factor each week, accounting for between 61.20% and 74.15% of the variance. An EFA for all 20 items accounted for 48.49% of variance in scores. Based on this information, I averaged multitasking scores for each participant across the five weeks to arrive at a single “average” multitasking score indicating, in general, how much each participant engaged in multitasking behaviors while working on their psychology research methods proposal.

**Attention.** Coefficient alpha for the attentional control measure was .84. As a check, an EFA was run, resulting in an Eigenvalue of 3.39 and 56.43% of variance accounted for by a single-factor solution in which all of the items demonstrated sufficient loadings above .4.

**Autonomy.** Coefficient alpha for the autonomy measure was .77. As a check, an EFA was run, resulting in an Eigenvalue of 2.07 and 68.82% of variance accounted for by a single-factor solution in which all three of the items demonstrated sufficient loadings above .4. Test-retest reliability was .32.

**Time Scarcity.** Coefficient alpha was consistent at .89. As a check, an EFA was run, resulting in an Eigenvalue of 3.96 and 66.00% of variance accounted for by a single-factor solution in which all of the items demonstrated sufficient loadings above .4.

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deadline, the due date for the proposal was shifted, and overlooked. As such, two sections (of 10) of students were surveyed for five weeks instead of four weeks.

## Appendix C: Supplementary Analyses

### Exploratory EFA of the Three Time-related Individual Differences

In an exploratory manner, an EFA was run on the three time-related individual differences to explore whether the dimensions/items conformed to the anticipated factor structure, and, furthermore, to attempt to clarify the time-related individual difference – time use dimension relationships by examining the individual differences as a set rather than separately (i.e., using multiple regression).

Given the ratio of items to people, a decision was made to first create scale scores based on the three highest factor loadings of each of the time-related individual difference dimensions. As such, a new EFA was run with a total of 18 items. Six factors were expected (i.e., present time perspective, future time perspective, three time urgency dimensions, and polychronicity). However, five factors were extracted with Eigenvalues ranging from 1.14 to 3.60, accounting for 69.19% of the variance. For the most part, the factors aligned with expectations (See table 58). The exception was the last dimension, which was a combination of parts of the future time perspective measure and a part of the general hurry dimension of time urgency. Note that these two dimensions were correlated ( $r = .41$ ). This result seems to indicate that future time perspective and a general hurry factor may both fall under the same broad dimension encompassing motivation to plan one's future and an urgency to work toward it.

Following this exploration, scale scores were created for the five dimensions. Next, a series of multiple regression analyses were conducted including all five dimensions as predictors of the various time use dimensions. Given the exploratory nature of these analyses, the personality control variables were omitted from these analyses. Of the eight hypotheses re-examined, the conclusion regarding only one of them changed (see Tables 59 through 61): Competitiveness (part of time urgency) was positively related to time management behaviors. Other results were consistent with the original set of analyses.

### Examining Quality of Time Management Behaviors

Beyond investigating the *quantity* of time management behaviors as above, an exploratory goal of this study was to examine the *quality* of time management behavior – a measure of efficiency such that more accurate estimates should result in better performance. More specifically, overestimates or accurate estimates of time should result in higher performance than underestimates of the necessary time to complete a task (e.g., increased “rushing” to complete a task). Existing evidence for this idea is sparse and with mixed results, with some studies offering support for people's overestimate of time to complete a task (Burt & Kemp, 1994) and some suggesting that they tend to

underestimate it (Francis-Smythe & Robertson, 1999b).

As part of students' weekly time diaries, they were asked to answer the following: "Please rate the amount of progress you made regarding your research proposal since your last lab [one week]" on a scale of 1 (Much less than I expected) to 5 (Much more than I expected). Ratings were averaged across weeks for each student and this score was correlated with self-perceived performance and instructor-rated performance. Accuracy was positively related to instructor-rated performance ( $r = .23, p < .05$ ), but negatively related to self-perceived performance ( $r = -.22, p < .01$ ). Interestingly, this suggests that the more people overestimate the amount of time a task will take (i.e., indirectly assessed by self-reporting how much progress was made in relation to expectations), the higher their performance. However, the opposite association was found with self-perceived performance.

Further exploration of the data week-by-week revealed another notable finding. In earlier weeks, progress estimates were unrelated to performance. However, the final week's estimate specifically was positively related to instructor-rated performance ( $r = .28, p < .05$ ). During the final week, all students had the same overarching goal of completing the remainder of their projects, regardless of how much of the task was left. It is possible that being able to evaluate the final, completed project led to more accurate assessments of whether they accomplished what they expected.

## **Appendix D: Dissertation Proposal Literature Review**

As work becomes more autonomous, issues surrounding time use are becoming more important. For example, some researchers have suggested that nearly every job requires at least some degree of multitasking (Bühner, König, Pick, & Krumm, 2006). On the other end of the spectrum, a recent 2008 survey of 2,500 (mostly full-time) employees in the U.S. reported that 22% of respondents wasted approximately two hours of each workday, and an additional 14% reported wasting three or more hours per workday (Salary.com). In fact, overall, 73% of employees reported spending a portion of their day doing non-work-related activities, filling their time with internet use (48%), socializing with coworkers (33%), conducting personal business (30%), making personal phone calls (19%), and taking long lunches or breaks (15%; Salary.com).

While the broad concept of time use is an inherent part of many aspects of work (e.g., long-range planning, distribution of tasks among team members, deadlines, interruptions), we know relatively little about how individual differences influence choices about structuring time, and how people choose to prioritize the amount of time devoted to a variety of activities throughout the workday. For example, while two people working in adjacent offices may make progress on the same tasks during the day, but through different means (e.g., drafting a paper using one block of uninterrupted time versus working intermittently on it throughout the day), there is little research examining what predicts one strategy versus another. Individual differences in awareness of time, construal of time, and preferences for using time likely predict much of this variability.

The purpose of this proposal is to offer a model of time use in organizations, linking time-related individual differences to dimensions of time use (i.e., time management, pacing, and multitasking), and task performance. This paper makes two primary contributions to our understanding of time use at work. While the topic of time, broadly construed, is gaining interest in the IO literature (e.g., Ancona, Okhuysen, & Perlow, 2001; Roe, 2008), most of the existing research comes from other disciplines approaching the topic from a variety of different perspectives (e.g., economic value of time as a resource, Becker & Mulligan, 1997; team or group communication, Ballard & Seibold, 2004; marketing, Kaufman-Scarborough & Lindquist, 2003). The first contribution will be to provide clarity to this disjointed body of literatures by incorporating the varied terminology and definitions, as well as integrate the topic of time with the context of work, which also should facilitate future research on this topic.

Second, to my knowledge, this is the first model testing the relationship between individual time-related differences and time use dimensions and performance. This model clarifies the existing dimensions of time use at work (Ballard & Seibold, 2003, 2004; Schriber & Gutek, 1987) and their relationships with both individual time-related

differences and performance. By testing a theoretical model of time use, we can begin to examine questions concerning whether there might be “better” ways of using time depending on individual differences in perceptions and preferences.

#### *Model Overview*

Figure 1 illustrates the proposed model incorporating both person and situational variables described below. The model begins with several time-related individual difference variables, namely time perspective, polychronicity, and time urgency. These individual differences in conceptualization of, awareness, and preference for using time, respectively, are hypothesized to relate to actual time use behaviors. Typically only a single aspect of time use is examined in a given study (e.g., “pacing”). In contrast, the second component of the proposed model includes several dimensions of time use: time management, pacing, and multitasking. Two moderators of these relationships are examined: perceived autonomy and time scarcity. Time scarcity, in addition, is expected to relate directly to some of the time use dimensions. Finally, time use behaviors are hypothesized to relate to performance outcomes. Each of these terms, as well as the linkages in the model, will be described in detail below.

#### Interactionist Framework

This study attempts to capture both individual and situational components using an interactionist approach, which refers to the combined influence of both personality and situational variables on attitudes, behaviors, cognitions, and emotions (Endler & Magnusson, 1976). Although the focus of this study is on time-related individual differences, situational variables also shape how people use their time. Not surprisingly, prior research does suggest that the shared influence of both individual and situational variables influence performance. For example, Greenberg (2002) examined whether time urgency and job characteristics in combination interacted on their effect on performance. In a study of personal time urgency and situational time urgency of a specific job, he found that performance was higher for those whose personal time urgency matched that of the job. Time urgent emergency room nurses, working in a highly time-urgent situation, had higher mean job performance than those with low personal time urgency. In contrast, low time urgent librarians were found to have higher mean job performance. Interestingly, in this study, no main effects were found, highlighting the importance of the combined effects of both individual differences and situational variables. Furthermore, Ballard and Seibold (2003), in their proposal of a multilevel model of organizational temporality, describe the influence of environmental, system, and personal characteristics. In line with this approach, here, I expect both time-related individual differences, as well as situational (i.e., autonomy and time scarcity) variables will influence time use behaviors.

#### Time-related Individual Differences

Individual differences in perceptions of time and preferences for using time are important to our understanding of how people choose to use their time (e.g., Conte, Schwenneker, Dew, & Romano, 2001). Three time-related individual differences are of interest in the present study: time perspective (emphasis placed on the past, present, and future), polychronicity (preference for engaging in two or more activities simultaneously), and time urgency (concern with the passage of time). These specific

variables were selected for inclusion based on a study of 24 time-related individual differences (Francis-Smythe & Robertson, 1999a), and their likely relevance to time use at work. In the Francis-Smythe and Robertson (1999a) study, a factor analysis yielded five factors. As this measure of “time personality” has infrequently been used to date, constructs consistent with their descriptions of the dimensions will be used. For the purposes of clarity, the terms time perspective, polychronicity, and time urgency will be used throughout. Different labels were applied to factors identified by Francis-Smythe and Robertson (1999a), although the definitions are relatively consistent with those provided for each of the three variables below. Two dimensions were excluded from current study: “leisure time” consisting of time spent outside of paid work and “punctuality”, which by definition is a part of the time urgency construct. Ballard and Seibold (2003) state that punctuality “centers around measures of precise timing” (p. 158). It captures a person’s attitudes toward being “on time” (Francis-Smythe & Robertson, 1999a). Time urgency has components of both keeping to schedules and adhering to external deadlines (Conte, Landy, & Mathieu, 1995), and those high in time urgency have been shown to be punctual to work (Dishon-Berkovits & Koslowsky, 2002). As such, for the purposes of this study, only time urgency will be discussed further.

Prior to examining these time-related individual differences in detail, it is important to consider how they relate to the well-known Big Five personality dimensions, and whether they likely contribute additional unique variance in predicting performance. Not surprisingly, time-related individual differences have shown substantial correlations with some of the Big Five personality dimensions. For example, future time perspective has been shown to be positively correlated with conscientiousness (.57) and openness (.11), while present time perspective has been negatively associated with conscientiousness (-.20, -.22), neuroticism (-.19, -.19) and openness (-.19; Zimbardo & Boyd, 1999). Polychronicity has been positively associated with extraversion (.21, Conte & Jacobs, 2003; .22, Conte & Gintoft, 2005) and conscientiousness (.14, Conte & Gintoft, 2005). Negative, albeit smaller, correlations were found between polychronicity and openness (-.12), agreeableness (-.01), and neuroticism (-.03; Conte & Gintoft, 2005). Finally, correlations between time urgency dimensions and conscientiousness ranges from -.07 to .26 (Conte, 1998).

However, while these time-related individual differences are associated with the Big Five personality dimensions, existing research also indicates that they do contribute incremental predictive validity above the Big Five personality dimensions. For instance, in a study of train operators, Conte and Jacobs (2003) concluded that polychronicity accounted for additional variance in lateness and absence beyond that explained by the Big Five traits of conscientiousness, extraversion, and neuroticism. In another study, Conte and Gintoft (2005) examined personality and polychronicity of retail sales associates, and found that polychronicity provided predictive validity above the Big Five in predicting several performance dimensions including sales performance, supervisor ratings of customer service, and overall performance. In light of these findings, each of the time-related individual difference variables will be described as they relate to time use dimensions and ultimately task performance.

### *Time Perspective*

Time perspective, also referred to as “temporal focus” or “time orientation”, is the “degree of emphasis [people place] on the past, present, and future” (Bluedorn 2000, p. 124), and consists of the subjective focus, or frame, a person takes when making decisions and taking actions (e.g., Boniwell & Zimbardo, 2003). This individual difference captures broadly how a person conceptualizes time. In line with the majority of current literature, I conceive of time perspective as dimensional, whereby scores exist on a continuum (Hofstede & Bond, 1988). Zimbardo and Boyd note that “scoring low on a scale of future perspective is not equivalent to scoring high on a scale of present perspective” (1999, p. 1273). These authors speak of five time perspectives: past-negative, past-positive, present fatalistic, present-hedonistic, and future (Zimbardo & Boyd, 2008). Zimbardo and Boyd (1999) examined the stability of time perspective as a trait using 58 undergraduate psychology students over a 4-week period of time. Test-retest reliability coefficients were 0.80 for future time perspective, and 0.72 and 0.76 for present time perspectives, respectively (a distinction is not made between present fatalistic and present-hedonistic time perspectives here).

Existing research on time perspective as an individual difference has focused on present and future perspectives (as opposed to a past-focused perspective) when studied in the context of work and organizations (Zimbardo & Boyd, 1999). Waller, Conte, Gibson, and Carpenter (2001) provide rationale for focusing on these two perspectives in stating that the emphasis in organizational research is typically on the impact of time these two time perspectives on decision-making and performance. Consistent with these authors, I focus on present and future time perspectives here.

People scoring high on the present perspective dimension focus on the “here and now,” with less concern with future goals or consequences. They have a tendency to believe that planning is not useful, are more likely to behave impulsively, and have a tendency to lose track of time (Zimbardo & Boyd, 1999). A high score on future time perspective is associated with more goal-directed behaviors, and imagining or envisioning an ideal future world (Boniwell & Zimbardo, 2003). Someone high in a future perspective tends to believe that present behaviors will have an influence on future goals and accomplishment of those goals (Jones, 1988). Moreover, future time perspective is associated with a tendency to be more inclined to consider future consequences, create to-do lists, maintain a daily planner/organizer, carry a watch, and define and set goals (Zimbardo & Boyd, 1999).

### *Polychronicity*

The remaining two individual differences are broadly concerned with preferences for using time. The first of these is polychronicity, which was first introduced by Hall (1959), and expanded upon by Bluedorn, Kalliath, Strube, and Martin (1999). Polychronicity is defined as, “the extent to which people prefer to be engaged in two or more tasks or events simultaneously, and believe their preference is the best way to do things” (p. 207). People’s standing on this trait falls on a continuum ranging from monochronic to polychronic. Bluedorn, Kaufman, and Lane (1992) provide a concrete example of the difference in how people on different ends of the continuum prefer to complete three tasks within an hour. Working on several pieces of the tasks at the same

time or interspersing the tasks within the hour constitutes a polychronic orientation. If a person instead prefers to complete all of part “A” and then all of part “B” before moving on to part “C”, that constitutes a monochronic orientation. Similarly, a manager who perceives a phone call as an interruption is more likely to fall on the monochronic end of the continuum, considering unscheduled or unplanned occurrences something to be minimized. With the escalating interest in multitasking in the workplace, polychronicity may have important implications for how people use their time and perform their work, especially under circumstances in which they are required to manage multiple responsibilities simultaneously (Onken, 1999). Concerning the stability of this trait, Bluedorn et al. (1999) reported a test-retest reliability coefficient of 0.89 in a sample of 23 managers over a two-week period, and a coefficient of 0.78 in an additional 21 managers over a month

An important distinction that warrants mention is between the terms “polychronicity” and “multitasking”. Currently, researchers are clarifying measurement issues that stem from the original conceptualization of polychronicity as a cultural variable (Hall, 1959). This variable was only later applied to individual-focused research questions. To remedy this confusion, König and Waller (2009) recommend using the term “polychronicity” only when describing the preference for working on several things at the same time. The term “multitasking”, however, should be applied to the *behavior* of engaging in multiple tasks at the same time. I follow this recommendation in describing the individual difference as a preference, which is thought to predict actual behavior. Thus, a person on the polychronic end of the continuum would be more likely to multitask.

#### *Time Urgency*

The last individual difference of interest also concerns a preference for using time. The concept of time urgency is a component of the Type A behavior pattern (Friedman & Rosenman, 1974). People high in time urgency have a tendency to construe time as a scarce resource, and as such, plan its use carefully (Landy, Rastegary, Thayer, & Colvin, 1991). Time urgency has previously been of most interest in predicting coronary heart disease and stress (e.g., Bond & Feather, 1988; Ganster, Schaubroeck, Sime, & Mayes, 1991) and has thus been heavily studied in the area of work stress and health (e.g., Friedman & Rosenman, 1959; Mohan, 2006). However, this individual difference has also been studied in performance-related literatures, as it has been associated with perceptions of deadlines, time awareness, and perceived rate at which tasks should be performed (Landy et al., 1991).

Time urgency consists of multiple dimensions. Landy et al.’s (1991) conceptualization includes five dimensions: competitiveness, speech patterns, eating behavior, task-related hurry, and general hurry. This factor structure was confirmed by Conte, Ringenbach, Moran, and Landy (2001), who found the same dimensions using a sample of 393 travel agents. Three of these dimensions are of interest in this study: competitiveness, task-related hurry, and general hurry. Speech patterns and eating behavior are not expected to relate to task work and performance, and as such, will not be discussed further. For the purposes of this study, I will collapse across these dimensions to examine overall time urgency in my hypotheses, as was done in the Greenberg (2002)



study. However, relationships will also be examined using the separate dimensions in an exploratory manner. Like the two variables described above, time urgency is also considered a personality trait. Landy et al. (1991) reported the following test-retest reliability coefficients for a sample of 132 clerical workers over four months and obtained the following coefficients: competitiveness (0.93), task-related hurry (0.95), and general hurry (0.90).

The next section of the paper describes dimensions of time use. Several researchers have proposed time dimensions used from cultural (Schriber & Gutek, 1987) and organizational (Ballard & Seibold, 2003, 2004; Benabou, 1999) perspectives. Rationale for why particular dimensions are selected for inclusion is provided prior to a detailed discussion of each. Links among time-related individual differences and time use dimensions are then described and hypotheses offered.

#### Time Use

Previous studies have described dimensions of time use from cultural (Schriber & Gutek, 1987) communication (Ballard & Seibold, 2003, 2004), and organizational (Benabou, 1999) perspectives. The current study is, to the best of my knowledge, the first attempt at empirically testing the relationships among a variety of time-related individual differences, time use dimensions, and performance. The first sets of linkages in the model are between the individual differences and time use behaviors. Time perspective, polychronicity, and time urgency may be directly related to the choices people make in using their time, including how they plan to use their time. Typically, individual studies examine one form of time use. For instance, a study may investigate the pacing of work (e.g., Gersick, 1988; Gersick, 1989; Gevers, Claessens, Van Eerde & Rutte, 2009), allocation of time (e.g., Burt & Kemp, 1994; Liddle, Westergren, & Duke, 1997; Nonis, Philhours, & Hudson, 2006) or time management strategies (e.g., Macan, 1994). However, examining one dimension of time use does not fully capture the multitude of ways in which people arrange and use time during the day.

I attempt here to examine several of the dimensions of time use found in the literature, expanding upon the existing studies of time dimensions at work. Schriber & Gutek (1987) previously examined time dimensions of work applied to organizational culture. These authors were most interested in describing these new dimensions, and as such, did not detail how these dimensions fit into a larger model of time use. More recently, Ballard and Seibold (2003, 2004) described ten dimensions (under two broad categories) of time in organizations within the context of communication among organizational members. Broad categories include *time construal* (i.e., “the way work group members interpret or orient to time”, p. 141) and *enactment of time* (i.e., “the way work group members perform time”, p. 140). Their construal dimensions included scarcity, urgency, and time perspective. Their time enactment dimensions included dimensions of flexibility, linearity, pace, precision, scheduling, and separation. In line with Ballard and Seibold (2003, 2004), I distinguish among time-related individual differences and actual time use behaviors, a differentiation not made by Schriber and Gutek (1987). I incorporate each of the relevant dimensions here, excluding variables outside the scope of this study (e.g., boundaries between work and nonwork). While listed under a variety of names, time use dimensions can be categorized broadly to the

following groups: time management, pacing, and multitasking. More specifically, these dimensions take account of the planning and scheduling of employees' tasks/workday (time management), the pace at which they choose to work (i.e., early-starter, consistent, procrastinatory "pacing"), and the number of tasks they choose to work on at a given time (multitasking). Each of the included dimensions will be more fully described in the subsequent sections.

Additionally, as mentioned above, situational influences, including time-related variables, likely interact with individual differences on both time use and performance behaviors. Both of the existing sets of time dimensions at work (Ballard & Seibold, 2003, 2004; Schriber & Gutek, 1987) include some variation of autonomy of time use and work constraints/overload variables. I will include these as situational moderators, as opposed to time use behaviors. For consistency, I will use the terms autonomy and time scarcity from this point forward. Each will be defined and described in later sections.

#### *Time-Related Individual Differences & Time Use*

##### *Time Management*

The first sets of linkages in the model illustrated in Figure 1 (corresponding to H<sub>1</sub>-H<sub>4</sub>) are the proposed relationships between the time-related individual differences defined above and time management. The idea of time management is founded on the assumption that recording and managing time has the potential to help a person effectively deal with his or her time (Drucker, 1966). I follow Koch and Kleinmann (2002) in defining time management as, "the self-controlled attempt to use time in a subjectively efficient way to achieve outcomes" (p. 201). This definition highlights three important components implied in much of the time management literature. First, some level of choice in how to use one's time is necessary for time management to have meaning. Second, time management behaviors are intended to achieve some goal. Third, an underlying goal of time management is to efficiently work with time. The definition of time management given above concerns the time management behaviors themselves (quantity), as well as efficiency (quality) of those behaviors. Thus, the frequency of engaging in time management behaviors of thinking about and deciding what one wants to accomplish in the short term, breaking larger tasks into manageable pieces is meaningful, as well as the efficiency of these behaviors. I focus on two of Macan, Shahani, Dipboye, and Phillips's (1990) dimensions of time management: 1) setting goals and priorities and 2) mechanics, comprised of scheduling and planning. The setting goals and priorities factor is intended to tap the setting of goals a person wants or needs to accomplish, and furthermore, prioritizing the tasks necessary to achieve his or her goals. The mechanics factor is intended to tap behaviors such as making lists and planning. Upon reviewing the items that make up each factor, it appears that setting goals and priorities reflects overall goals, both small and large (e.g., write research paper), while the second factor, mechanics, reflects behaviors used to keep track of smaller parts of each goal (e.g., writes reminder notes, carries an appointment book). These dimensions were the result of a factor analysis and are commonly used in the time management literature (e.g., Adams & Jex, 1997; Kelly, 2003; Macan, 1996). A third factor, preference for disorganization, was also uncovered. However, this factor consists of a preference for workspace or disorganization, and is less behavioral than the other two (e.g., "I can find the things I

need for my work more easily when my space is messy and disorganized than when it is neat and organized”). As such, the focus of this paper will remain on the two behavioral dimensions of time management.

Interestingly, while time management has intuitive value in enhancing performance through more effective use of one’s time, time management training has not always been shown to increase time management behaviors (Macan, 1996). Examining antecedents and moderators will provide a more complete understanding of when time management behaviors lead to higher performance. In fact, Claessens, van Eerde, Rutte, and Roe (2007) recently posited that certain personality traits might act as antecedents to time management. As such, I propose that a person’s standing on the three time-related individual differences predicts time management behaviors of setting goals and priorities and mechanics. The subsequent section describes links between each of the time-related individual differences and time management.

#### *Time Perspective and Time Management*

Beginning with time perspective, which taps a person’s emphasis on past, present, and future time, it is hypothesized that standing on the present and future dimensions of time perspective will be associated with more or less time management. The reasoning for this is as follows. Time perspective is thought to shape a person’s expectations, goals, and imagination (Boyd & Zimbardo, 2005). More specifically, Waller et al. (2001) suggests that time perspective may influence how individuals behave in regards to time, whereby a person’s perspective becomes a temporal cognitive frame. Subsequently, this influences planning and engaging in certain activity. This idea is similar to that expressed in Furey (1994) and Furey and Stevens’s (2004) Theory of MindTime, which states that past, present, and future thinking provide an evolutionary advantage, parallel to the idea that time perspective shapes a person’s expectations and goals.

Furey and Steven’s (2004) logic suggests that *present* thinking provides the ability to integrate one’s current needs within the broad past/future framework. Present time perspective is often associated with a more short-term focus (Boyd & Zimbardo, 2005) – a “here and now” mentality with less concern with future goals or consequences. Moreover, as previously mentioned, a high present perspective is often associated with the perception that planning is not useful, impulsivity, and losing track of time (Zimbardo & Boyd, 1999). As someone high on present perspective tends to view future behaviors as unrelated to goal accomplishment, it seems likely that present time perspective would be negatively related to time management, as future behaviors are perceived as futile in accomplishing later (or longer-term) goals.

*H1: Present time-perspective is negatively related to the time management behaviors of 1) setting goals and priorities and 2) scheduling and planning.*

Future time perspective, on the other hand, has been called “big picture” thinking (Fortunato & Furey, 2009), and provides people with the ability to imagine future possibilities. Moreover, a future time perspective involves problem-solving behavior – the ability to perceive gaps in one’s current knowledge, see patterns and trends, and restructure information. Intuitively, a future perspective is associated with a more long-term, goal-focused perspective, and corresponding behaviors. A long-term, goal-focused perspective, in turn, should be related to each of the time management behaviors. Related

studies lend support to this idea. For example, Murrell and Mingrone (1994) examined dispositional and behavioral indices of both present and future perspectives of the Gonzalez and Zimbardo (1985) scale using undergraduate students who completed time diaries. Findings suggested that those with a high future time perspective focused on success through goal-directed behaviors, participating in many activities to work toward/achieve their goals. In addition, more recent results suggest a future perspective predicts academic engagement (Horstmanshof & Zimitat, 2007) and less procrastination (Díaz-Morales, Ferrari, & Cohen, 2008), which are indicative of more planning behaviors.

As time management consists largely of goal-directed activities, more future-oriented people should be inclined to engage in time management behaviors. More specifically, a person believing that their current behaviors will influence later goal attainment (Jones, 1988) should engage in both types of time management behaviors. As such, the following hypothesis is offered:

*H2: Future time-perspective is positively related to the time management behaviors of 1) setting goals and priorities and 2) scheduling and planning.*

#### *Polychronicity and Time Management*

The next set of hypotheses describes the link between polychronicity and time management. It is argued that both more monochronic and polychronic individuals engage in time management behaviors, but that people higher on the trait of polychronicity will exhibit a greater number of time management behaviors than those on the opposite end of the spectrum.

In a situation allowing for choice in time use, existing empirical research lends support to a positive relation between polychronicity and time management behaviors. Wastag and Conte (2009) examined how polychronicity relates to a number of behaviors (i.e., general hurry, work pace, extraversion, and punctuality), as well as provide a rationale for why people with a polychronic (versus monochronic) orientation might engage in time management behaviors. Findings suggest that polychronicity is positively related to general hurry, which is associated with a tendency to plan too much to do in too little time (Rastegary & Landy, 1993). Wastag and Conte (2009) suggest that someone with a polychronic tendency, upon discovering that they do not have sufficient time to complete a task, will then attempt to make up for “lost” time by working on more than one thing at once. In turn, this leads to additional planning and scheduling. Consistent with this idea, Kaufman-Scarborough and Lindquist (1999) asked participants to engage in multiple tasks over time, thus, explicitly testing the relation between the individual difference (polychronicity) and subsequent behavior (multitasking; this link will be more fully examined later in the model). They found that people on the monochronic end of the continuum engaged in more detailed planning, although authors did not measure time management. Of consequence in the current study, polychronic participants in the Kaufman-Scarborough (1999) study could not enact their planning well. Those with a more polychronic orientation, however, perceived they reached their planned goals more often and were better able to handle interruptions. As such, it is hypothesized that those scoring higher on polychronicity will engage in a more time management behaviors. Note that this hypothesis speaks only to the relation between one’s tendency to prefer engaging

in multiple tasks simultaneously or switching back and forth among them. Thus, the following hypothesis is offered:

*H3: Polychronicity is positively related to the time management behaviors of 1) setting goals and priorities and 2) scheduling and planning.*

#### *Time Urgency and Time Management*

The final set of hypotheses in this portion of the model link time urgency and time management behaviors, which are hypothesized to be positively related. While limited research exists for this particular relationship, there are a couple of empirical and theoretical studies which indirectly suggest that a positive association between time urgency and time management behaviors is probable. The rationale for this assertion is as follows. Recall that time urgency consists of a focus on the passage of time, and this variable affects perception and use of time (Rastegary & Landy, 1993). Strube, Deichmann, and Kickham (1989) concluded that individuals high in time urgency have a tendency to be more attentive to time and deadlines than those low in time urgency. Moreover, the dimensions themselves (i.e., time awareness, scheduling, list-making, deadline control, eating behavior; Conte et al., 1995) appear to relate closely to the mechanics dimension (i.e., scheduling and planning) of time management (Macan et al., 1990).

Thus, a more time urgent person, with an overall greater awareness of both time and deadlines, would be more likely than a person lower in time urgency to engage in both dimensions of time management – setting and being aware of goals and approaching deadlines, as well as creating plans and organizing/scheduling a method to complete tasks on time. In fact, Waller, Giambatista, & Zellmer-Bruhn (1999) lend support for time urgency's link to aspects of time management when they found that time urgent individuals had a tendency to impose strict schedules on their team members, suggesting a relationship with planning and scheduling dimensions of time management. Furthermore, members pushed their team members to focus on one task at a time, and frequently reminded teammates of the approaching deadline (Waller et al., 1999). While not explicitly tested, pushing members to focus on the task at hand could be construed as prioritizing that task over others. Moreover, in a theoretical piece considering both time perspective and time urgency, Waller et al. (2001) posit that time urgent individuals with a future time perspective will exhibit achievement striving, high time awareness, and a need to schedule. Taken together, the empirical and theoretical work on this link suggests that time urgency should be positively related to time management behaviors, as well as accurate estimates of task duration.

*H4: Time urgency is positively related to the time management behaviors of 1) setting goals and priorities and 2) scheduling and planning.*

In addition to the quantity of time management behaviors, the quality of planning and scheduling behaviors may also be meaningful in predicting performance. Francis-Symthe and Robinson (1999b) examined estimation of task duration (i.e., estimate of the length of time to complete work on a task) in addition to the quantity of time management behaviors. As I see it, examining the accuracy by which people are able to estimate the time needed to complete their work can be construed as a measure of efficiency, in that more accurate estimates should result in the best use of one's time.

Accurate estimates of time would suggest a person would be able to plan his or her workday efficiently, not planning far more than could be accomplished and not planning too little. In general, findings concerning people's accuracy in estimating time are mixed. Burt and Kemp (1994), for example, found that people tended to overestimate the amount of time necessary to complete tasks. Francis-Smythe and Robertson (1999b), however, demonstrate the opposite result, finding that a large number of participants underestimated how long a task would take to complete. However, these authors found that people who engaged in more time management behaviors estimated expected durations more accurately than those who practice less time management behaviors. As the majority of the time management literature focuses on the behaviors listed above, I intend to examine the quality of time management in the form of accuracy of task duration estimates in an exploratory manner. Specific hypotheses are not offered.

### *Pacing*

The second aspect of time use is the manner in which people pace their activities (i.e., how they divide their time to work on a given task; corresponding to H<sub>5</sub>-H<sub>6</sub>). People differ in their pacing of work tasks. Whereas some people seem to struggle to meet deadlines, others seem to have methods of effectively pacing themselves before an upcoming a deadline (e.g., Gevers et al., 2009). Moreover, some people elect to start a new project immediately upon receiving instruction, and others tend to wait until another point in time, whether that be in the middle, or nearer to the deadline (when given the autonomy to do so). I am conceptualizing pacing here as *when* a person chooses to work on a task (as opposed to the *rate* at which a task is completed (e.g., Levine, 1988; Okhuysen & Waller, 2002; Schriber & Gutek, 1987)<sup>15</sup>, borrowing from Gevers et al.'s conceptualization of pacing styles, or "types", in this case.

Pacing is comprised of, or requires, both monitoring the passage of time and an awareness of deadlines (Waller, Zellmer-Bruhn, & Giambatista, 2002). Gevers, Mohammed, Baytalskaya, and Beeftink (2008) refined the conceptualization of types of work pace, concluding pacing could be categorized into different types: "steady action" in which the work is completed at a steady pace throughout, spreading work out evenly from the start of a project to the deadline; "u-shaped" in which more effort is put forth at the beginning and end of the allotted time (Claessens, 2004), and "deadline action" in which most of the work is done immediately preceding a deadline. Finally, "early action" refers to a pattern in which someone starts activities early and ensures that the work is finished long before an approaching deadline (Gevers et al., 2008).

### *Time Perspective and Pacing*

Two of the time-related individual differences of interest in the current proposal are expected to relate most strongly and directly to specific types of pacing. First, present and future time perspectives are hypothesized to relate to pacing differently. A high present time perspective is expected to be most strongly associated with deadline action. Because someone high on this dimension tends to believe that planning is not particularly fruitful and also tends to lose track of time (Zimbardo & Boyd, 1999), he or she is not

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<sup>15</sup> There two related ways to think about work pace: the speed or *rate* at which individuals work, and *when* they do so.

expected to take an “early action” approach. Rather, it is expected that people high on this dimension, when given the option to use their own time, would instead focus on only the most pressing, near deadlines, thereby leaving the majority of the work involved in a task toward the end of a deadline. As such, the following hypothesis is offered relating present time perspective and pacing.

*H5a: Time perspective is related to pacing such that present time perspective is positively associated with the deadline action type.*

A person scoring high on future time perspective is expected to select pacing types further from a deadline. Because people high on this dimension tend to be more goal-directed (Boniwell & Zimbardo, 2003) and to believe that present behaviors will have an influence on accomplishment of those goals (Jones, 1988), future time perspective is expected to be positively associated with more planned pacing approaches. More specifically, in considering future consequences, making plans, and setting goals (Zimbardo & Boyd, 1999), people high on future time perspective should be more likely to select an early or steady pace. It is not expected that early or steady types of pacing are more or less likely, as a plan may include accomplishing the work by either means. Thus, a second hypothesis is offered linking time perspective and pacing.

*H5b: Time perspective is related to pacing such that future time perspective is positively associated with either early or steady pacing types.*

#### *Polychronicity and Pacing*

Polychronicity is not expected to relate more strongly to any of the distinct pacing categories, as solid theoretical support for why a person high in this trait would select a particular pattern of pacing over another is lacking. While polychronicity has been shown to be negatively associated with other related forms of timing (e.g., punctuality, Benabou, 1999), the pattern or pace of time use of is of most interest here. As such, a specific prediction is not made here. However, relationships will be examined in an exploratory fashion.

#### *Time Urgency and Pacing*

Time urgency, however, is expected to relate to pacing type. In a theoretical paper, Waller and colleagues (2001) suggested that time urgency may interact with time perspective to predict group performance for different types of deadlines. Here, time urgency is anticipated to be positively related to early action pacing more so than other types of pacing. As individuals high in time urgency have a tendency to be more attentive to time and deadlines than those low in time urgency (Strube et al., 1989), it is expected that they would elect to finish tasks early. A focus on deadlines seems likely to lead to self-imposed pressure to finish a task on time. In support of this notion is Waller et al.'s (1999) finding that those high in this trait tend to push team members to stick to a specific schedule, including reminding them of an upcoming deadline. As such, the following hypothesis is offered regarding time urgency and work pace type.

*H6: Time urgency is positively related to the early action pacing type.*

#### *Multitasking*

The final sets of linkages in this part of the model (corresponding to H<sub>7</sub>-H<sub>8</sub>) relate individual time-related differences to multitasking behaviors. Multitasking is defined as the *behavior* of engaging in multiple tasks at the same time (König & Waller, 2009), or

the act of switching back and forth between or among activities (Bluedorn, 2002). Here, a distinction is made between the preference (polychronicity) and the actual behavior of multitasking, although the terminology in the existing literature often uses the term polychronicity interchangeably for both the trait and actual behavior of multitasking.

#### *Time Perspective and Multitasking*

Time perspective is not expected to relate to multitasking behavior. This time-related individual difference consists of an overall outlook on time, broadly encompassing how a person conceptualizes time (Boniwell & Zimbardo, 2003). Time perspective itself appears to relate more so to decisions concerning *when* to do work, as opposed to the number of tasks to do at one time. Situational constraints aside, there is not a strong theoretical rationale for predicting a positive or negative relationship between standing on present or future time perspectives and multitasking. As such, a specific hypothesis will not be explored further here. Again, this relationship will be explored in an exploratory fashion.

#### *Polychronicity and Multitasking*

Polychronicity, on the other hand, is expected to relate positively to multitasking behavior. There is growing support for the relationship between polychronicity and multitasking. Zhang, Goonetilleke, Plocher, and Liang (2005), for example, conducted a lab study in which they asked participants to monitor and control two processes at the same time. Switching back and forth is indicative of multitasking because it is another way of engaging a number of tasks during the same period (Bluedorn, 2002). Zhang and colleagues (2005) found that those with a monochronic orientation attempted to control the tasks serially, while those with a polychronic orientation attempted to control both processes simultaneously. Furthermore, a recent study found that polychronicity predicted both the enjoyment of a “multitasking” simulation, as well as the number of tasks on which participants chose to work (Poposki & Oswald, 2008). As such, Hypothesis 7 is an attempt to replicate a general positive relationship between polychronicity and multitasking. Thus:

*H7: Polychronicity is positively related to multitasking.*

#### *Time Urgency and Multitasking*

Finally, time urgency is expected to be related to multitasking. The following rationale suggests that time urgency would be positively related to this time use dimension. Time urgency relates to an intense focus on one’s present task. With a focus on the passage of time, those high on time urgency report experiencing being agitated and restless during “downtime” (Frankenhaeuser, Lundberg, & Forsman, 1980) and are uncomfortable with even brief moments of inactivity (e.g., wasting time by taking breaks or relaxing; Price, 1982). In accord with the findings of Ishizaka, Marshall, and Conte (2001), because time urgent individuals seem to have a high need for achievement, their time-oriented perspective may lead them to schedule more tasks, meetings, and appointments than the 24-hour day will allow (Friedman & Rosenman, 1974). This self-imposed time pressure means that a person must be highly attentive to work tasks during all available time. As such, people high on this trait are expected to attempt to fill their time with multiple work-related activities simultaneously or during moments of downtime whenever possible. Thus, the following hypothesis is offered:



*H8: Time urgency is positively related to multitasking.*

Prior to a discussion of moderators of time-related individual differences and time use dimensions, the situational perception of time scarcity is examined in relation to time use dimensions. The variable is expected to be directly related to time use, as well as moderate the linkages among the time-related individual differences and time use dimensions (H<sub>9</sub>-H<sub>10</sub>).

#### *Time Scarcity*

Time scarcity is defined as the perception of time as both a limited and exhaustible resource (Karau & Kelly, 1992), similar to the experience of subjective time pressure. Kaufman-Scarborough and Lindquist (2003) provide a description of time scarcity as a preference by stating that it is quite possible for certain people with much to do to feel comfortable with their “time supply” either because they are skilled at organizing or efficiently using time, or simply feel at ease with their time supply overall. In contrast, other people with far less to do may experience elevated time scarcity because they are unskilled at using their time or perpetually feel short on time. Thus, the *perception* of the amount of time one has and whether that time will be enough to complete one’s work matters. Consequently, a time scarce situation (or perception of) is one in which there exist too many tasks to complete within a given amount of time (McGrath & Kelly, 1986), which creates a sense of time pressure. In turn, time management behaviors are expected to increase. Thus, in a situation in which a person perceives a lack of time, planning the manner in which work will be accomplished becomes critical to task completion. As such, a direct association is expected between perceptions of time scarcity and time management behaviors of setting goals and priorities, as well as between scheduling and planning:

*H9: Time scarcity is positively related to time management behaviors of 1) setting goals and priorities and 2) scheduling and planning.*

Furthermore, in a situation in which time scarcity is experienced, a direct relationship is expected between time scarcity and multitasking such that the greater the perception of time scarcity, the more likely a person engages in more tasks simultaneously (e.g., taking a business call while attempting to respond to email) in an attempt to “catch up” on work and reduce the sense of time scarcity. Thus:

*H10: Time scarcity is positively related to multitasking.*

#### *Moderators of Individual Differences – Time Use Relationship*

Although I expect each of the time-related individual differences to be directly related to some or all of the dimensions of time use examined here, there are, clearly, situational moderators that may have a meaningful influence on these linkages, as the context, or situation, is an integral component of this model. The following moderators speak to situational constraints in which people are working. In light of the time dimensions described by both Ballard and Seibold (2003) and Schriber and Gutek (1987), two relevant time-related variables are of interest in their likely influence on the relationship between the individual differences and time use: perceived autonomy and time scarcity. Both will be defined and described below prior to discussing hypothesized relationships. Hypotheses correspond to H<sub>11</sub> and H<sub>12</sub> in Figure 1.

#### *Perceived Autonomy*

Autonomy is expected to moderate the relationship between the time-related individual differences and each of the time use dimensions such that the relationship is stronger with greater perceived autonomy. Research supports the idea that autonomy moderates the relationship between individual differences and performance (e.g., Barrick & Mount, 1993). In keeping within an interactionist framework, autonomy is one of the major components of the job characteristics model (Hackman & Oldham, 1975), defined as the amount of freedom a person has in setting schedules to complete his or her tasks or work (McGrath & Kelly, 1986; Schriber & Gutek, 1987). *Scheduling* autonomy, specifically, is of interest in this study, which includes discretion over scheduling, sequencing, and timing of work (Breugh, 1989).

Autonomy is thus a situational component, defining the “strength” of the situation (Mischel, 1977). It is a boundary condition in that a weaker situation allows for more discretion in setting one’s schedule and priorities. Considering time management as an example, by definition this dimension of time use implies that a person has some decisive power in how they schedule work activities (Koch & Kleinmann, 2002). Thus, in a strong situation (i.e., clear norm of behavior), managing time relates little to preferences or performance. A couple of examples may serve to clarify the relationships. Recall the predictions between present and future time perspective dimensions and time management behaviors. It was hypothesized that standing on future time perspective would be positively associated with time management behaviors of planning and scheduling. A negative relationship was expected between present time perspective and time management. These relationships, however, are expected to be stronger as the level of autonomy increases. For instance, take a project manager high on future time perspective expected to engage in many planning and scheduling behaviors. This person, with a high level of autonomy, may plan to visit “X” number of project sites on Monday, create a specific route (i.e., schedule) to visit each of them throughout the day as efficiently as possible. A project manager high on present time perspective, on the other hand, may haphazardly decide to do site visits on Monday, but fail to map out an efficient plan for how to accomplish the work during the day. However, the relationship between time perspective and time management behaviors is likely to be attenuated in a situation allowing minimal autonomy, such that individual differences matter less in a context without choice. Thus, if we take both project managers from above, and instead place them on a paced assembly line, their conceptualizations about time, planning, and scheduling are irrelevant. The work happens in a predetermined fashion and pace.

Thus, H<sub>11a</sub> – H<sub>11c</sub> detail the expected change in the relationships between time-related individual differences and time use dimensions, all of which are expected to become stronger with increasing levels of autonomy. Each set of relationships between a time-related individual difference and time use dimensions will be briefly described before offering a hypothesis. First, the associations between both dimensions (present and future time perspective) and time use behaviors are expected to increase with greater levels of autonomy such that for someone high in present time perspective, fewer time management behaviors are expected, along with later pacing of a task (i.e., working on the majority of the work even closer to the deadline). Similarly, the expected relationships between these two time dimensions and future time perspectives are

expected to be stronger with increased levels of autonomy. Consequently, someone high on the future time perspective dimension is expected to engage in more time management behaviors and earlier pacing of work. Thus:

*H11a: The relationships between the present and future time-perspectives and the time use dimensions of time management and pacing become stronger as autonomy increases.*

Autonomy is also expected to strengthen the relationship between polychronicity and time use dimensions such that as polychronicity increases, time management behaviors increase, as well as multitasking behaviors. Considering the preference of someone high on polychronicity to engage in abundant plans (in number) and to work on multiple tasks in a given amount of time, being provided with more freedom to choose how to use time should result in more of these behaviors. As such:

*H11b: The relationships between polychronicity and the time use dimensions of time management and multitasking become stronger as autonomy increases.*

Finally, autonomy is expected to increase the association between time urgency and the time use dimensions of time management, pacing and multitasking. The rationale for proposing the strengthened relationships here is similar to that of the other two time-related individual differences in that increased choice in how to use one's time should result in time use based more heavily on individual preferences. In this case, time urgency should be associated with more time management behaviors, earlier pacing, and more multitasking. Thus,

*H11c: The relationships between time urgency and the time use dimensions of time management, pacing, and multitasking become stronger as autonomy increases.*

#### *Time Scarcity*

The second situational moderator discussed here is time scarcity (or availability). The perception of available time is of interest here, and its influence on the relationship between time-related individual difference variables and time use dimensions. Time scarcity is expected to moderate the relationships between time-related individual difference and time use dimensions as follows. First, consider time perspective as it relates to time use. Here, the experience of time scarcity is expected to increase time management behaviors for those high on both present and future time perspectives. As hypothesized above, future time perspective is expected to be positively associated with time management behaviors. Those high on future time perspective are also more likely to be more goal-directed, and believe that their planning is useful (Zimbardo & Boyd, 1999). In contrast, present time perspective is not expected to be associated with time management behaviors, as people high on this dimension tend to believe that planning is not useful and lose track of time (Zimbardo & Boyd, 1999). However, I argue that with the experience of "time scarcity", where people perceive too much to do with too little time, the relationship between time perspective and time management may be reduced, as the perceived situation would motivate people, regardless of their time perspectives, to plan and schedule. However, there is little evidence to support a change in pacing behavior (i.e., *when* work happens as opposed to *rate*) as a result of increased time scarcity, nor is there compelling evidence to support a change in the behavior of present

versus future focused people in their tendency to multitask. As such, the following hypothesis is made:

*H12a: The relationship between the present and future time-perspectives and time management is moderated by time scarcity such that time management behaviors increase as time scarcity increases.*

The second set of relationships concerns time scarcity's influence on the polychronicity-time use relationships. Here, it is expected that the experience of time scarcity will act on the time use dimensions of time management and multitasking. As polychronicity was not hypothesized to relate to any one type of pacing more than another, a moderated relationship is not hypothesized here. Concerning the two remaining time use dimensions, the relationship between polychronicity and time management is such that someone high in polychronicity tends to plan more than he or she can complete in the allotted time (Rastegary & Landy, 1993). This pattern of time use lends itself to the experience of a shortage of time to complete the work a person has planned to do in a given amount of time. In fact, Wastag and Conte (2009) describe a type of spiral in which, upon discovering insufficient time to complete a task, polychronic people attempt to make up for "lost" time by working on more than one thing at once. In turn, this leads to additional planning and scheduling. The experience of increased time scarcity is thus expected to exacerbate this relationship. As such, the more time urgency, the more a polychronic person is likely to plan and schedule.

*H12b: The relationship between polychronicity and time management is moderated by time scarcity such that time management behaviors increase as time scarcity increases.*

A similar hypothesis is made concerning the time use dimension of multitasking. Here, I hypothesize that time scarcity exacerbates this link such that as time scarcity increases, the relationship between polychronicity and multitasking increases (i.e., the more time scarcity a highly polychronic person perceives, the more multitasking behavior he or she will engage in). Wastag and Conte (2009) support this idea when they suggest polychronic people will attempt to make up for lost time by working on more than one thing at once when they discover that they do not have enough time. While time scarcity does not necessarily result from an inaccurate time estimate, as is implied here, the logic suggests that those with a polychronic tendency tend to multitask when feeling pressed for time. As such, I hypothesize the following:

*H12c. The relationship between polychronicity and multitasking is moderated by time scarcity such that multitasking increases as time scarcity increases.*

The final time-related individual difference-time use relationship is time urgency. Time scarcity is expected to increase the association between time urgency and time use dimensions. Recall that findings from the team literature suggest that time urgent team members urged other group members to focus on the single task at hand as deadlines approached (Waller et al., 1999). With their tendency to be aware of deadlines, the experience of time urgency should strengthen the relationship between both time urgency and time use behaviors of time management and pacing, such in a time scarce environment, people high on time urgency should engage in more time management behaviors and select earlier pacing of work. Finally, considering the finding that time

urgent individuals aim to focus on one task when the deadline approaches (Waller et al., 1999), I suggest that time urgency would be negatively associated with multitasking under perceptions of time scarcity. Thus, the following hypothesis is offered:

*H12d. The relationship between time urgency and the time use dimensions will be moderated by time scarcity such that the relationship with time management will be strengthened, earlier pacing selected, and the relationship with multitasking will be attenuated.*

#### Performance Outcomes

The rightmost section of the model describes linkages between time use dimensions and task performance outcomes (corresponding to H<sub>12</sub>-H<sub>13</sub>). Organizations are ultimately interested in performance outcomes. While it is inherently interesting to consider questions surrounding the manner in which people's time preferences and construals influence their time use behaviors, it is of perhaps more practical use to examine how these concepts relate to performance outcomes.

Time use is expected to relate to task performance, defined in this context as student and instructor-rated assessment of performance (i.e., rating scale for students, grades from instructors). Existing literature lends some support to the relationship between time use dimensions and performance outcomes, although not through the model proposed here. For example, Lim and Seers (1993) found that future time perspective, autonomy of time use, and allocation of time together predicted the performance of managers. Moreover, Gersick (1989) studied group pacing and found that those with more successful midpoint transitions performed better than those who less accurately paced their available work time.

#### *Time Management and Performance*

The first link in this piece of the model is between time management and performance. Interestingly, findings are mixed concerning this link. Although time management should be positively related to performance through more effective prioritization of time, this is not always the case. For example, in a theoretical process model proposed by Macan (1994), time management behaviors were related to outcomes through perceived control of time. It was posited that by engaging in more time management behaviors, a person would experience a greater sense of control over his or her time, such that by prioritizing, making lists/plans, and organizing, a person acquires a sense of control over how he or she uses (i.e., perceived control over time). However, while the related outcomes included reduced job-related tensions and somatic tensions, performance was unrelated ( $r = .01$ ) to time management through perceived control over time. There exists a number of possible reasons for the mixed findings concerning the time management-performance relationship (e.g., sample specific findings, Macan, 1994, time management's relationship with different aspects of performance, questions concerning whether time management actually leads to more effective use of time). Furthermore, these studies typically speak only to the quantity of time management behaviors, as opposed to the combination of quantity and *quality* of the prioritizing, planning and scheduling.

In contrast to the above findings, other empirical work supports the relationship between time management behaviors and performance. For example, positive

relationships have been found between time management and objective GPA (Britton & Tesser, 1991) and self-perceived organizational performance (Lim & Seers, 1993). Others have found certain dimensions of time management related to performance. Claessens et al. (2004) found that the *planning behavior* dimension of time management was related to higher job performance. Furthermore, Barling, Kelloway, and Cheung (1996) found that short-range planning interacted with achievement striving to predict job performance of car salespeople. As such, I aim to replicate the positive relationship between time management and performance outcomes in offering the hypothesis below. In addition, the quality of time management behaviors will be examined in an exploratory manner by exploring the accuracy of task duration.

*H13: Both a) setting goals and priorities and b) scheduling and planning dimensions of time management are positively related to performance.*

#### *Pacing and Performance*

The second time dimension in the model is pacing. Here, I suggest that the various types of pacing are differentially related to performance. More specifically, later pacing likely results in a more “rushed” use of time, leading to poorer performance. Existing research lends some support to this idea. Labianca, Moon, and Watt (2005) describe temporal schemata as a method by which people both identify and interpret deadlines. In this case, this individual theory was applied to groups pacing their time in typical and atypical units of time. They found that groups working within an hour-long deadline that began *on* the hour (e.g., 10:00 a.m.) performed better than those who began the task at an atypical time (e.g., 3:52 p.m.). In fact, the atypical groups transitioned from an idea generation/planning phase to an action phase later than the typical groups, resulting in insufficient time to work on the task itself. Gersick (1989) provides similar findings of group pacing, concluding that successful groups proceed through a “punctuated equilibrium” from one phase of work to another. Although these studies were done in teams, their findings should apply to individuals as well. Both imply that the timing (in addition to rate) of work has implications for later performance outcomes. Similarly, there exists quite a large literature on the nature and negative consequences of a “later” pacing style found in the literature on procrastination (e.g., Ariely & Wertenbroch, 2002; Moon & Illingworth, 2005). For example, Chandler (2007), in her dissertation research, demonstrated that when work pace (rate) is too high, the performance of students decreases. This high work pace is likely (and required) if the majority of it needs to be completed near the deadline, as opposed to further from the deadline. As such, it is expected that the “early,” “steady,” and “u-shaped” pacing types lead to better performance than the “deadline” pacing type. Thus:

*H14: Pacing is related to task performance such that early, steady and u-shaped pacing are associated with the highest task performance.*

#### *Multitasking and Performance*

Broadly speaking, research suggests that multitasking often changes (decreases) a person’s focus. For example, considering simultaneous multitasking, the human performance literature provides convincing evidence of reduced driving performance while using a cell phone, (e.g., Charlton, 2009). Leroy (2009) provides clarity to the multitasking-performance relationship when she found that people have difficulty in

switching their attention to a second task, particularly if they have not finished the first one, and without time pressure. Thus, people who finished one task prior to switching to another task were able to focus their attention on the second one.

However, research does suggest that people who enjoy multitasking are better able to manage simultaneous tasks. For example, Zhang et al. (2005) found that in a situation in which people were asked to manage two tasks simultaneously, people with a more polychronic orientation made fewer mistakes than those with a more monochronic orientation. Despite this finding, the above research suggests that in general, performance requiring attention does suffer when it is divided among different tasks, as the ability to focus is reduced. Thus, a final hypothesis is offered:

*H15: Multitasking is negatively related to task performance.*

#### *Summary of Hypotheses*

In general, the predictions outlined above describe specific relationships among time-related individual differences and time use behaviors. Each of the time use dimensions is then discussed as it relates to performance outcomes. In this case, the outcomes correspond to self-rated and instructor-rated performance on academic goals. For clarity, a list of hypotheses is provided in Table 1, and a matrix of expected positive and negative relationships is listed in Table 2.

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## **Curriculum Vitae**

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